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Silver Jubilee Number

The Mysore Agricultural Journal

(The Organ of the Mysore Agricultural and Experimental Union)

Vol. XXIII] 1944–45 [No. 2

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1945

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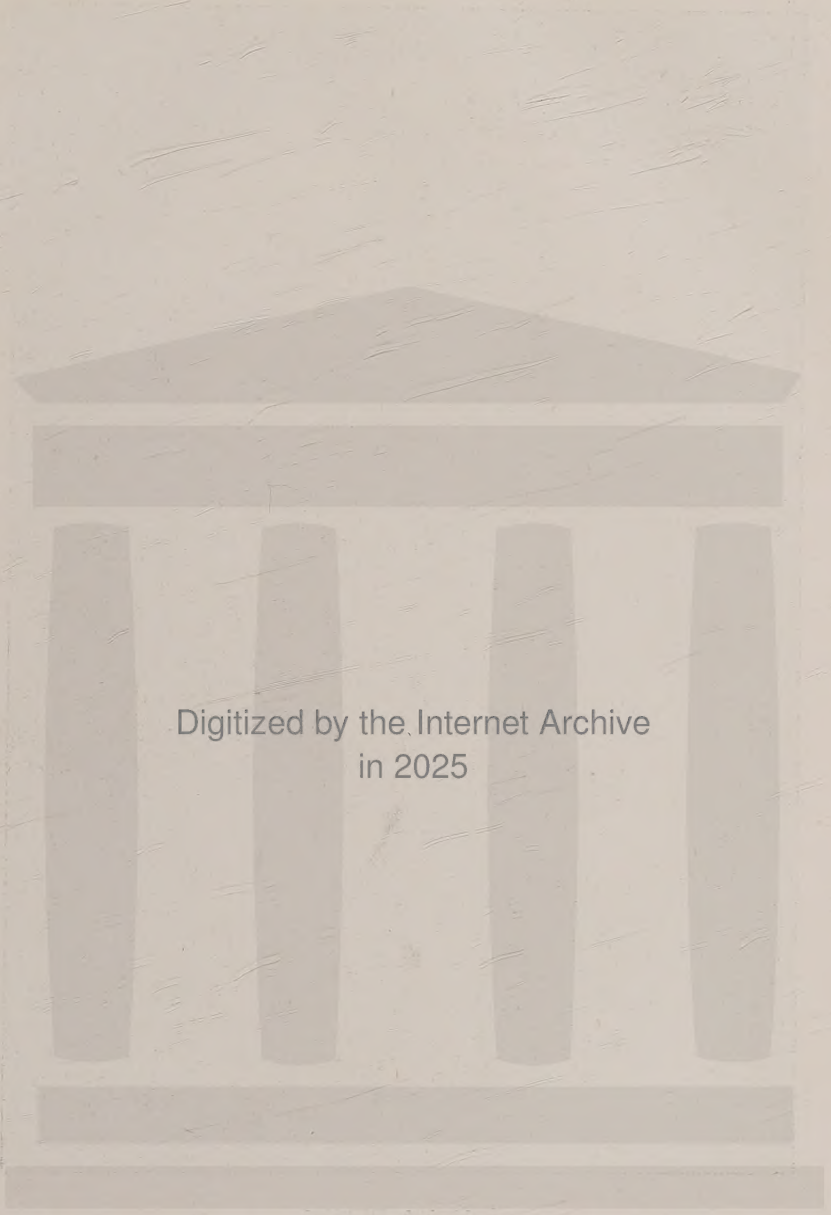
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PRADHANA SIROMANI
N. MADHAVA RAU, B.A., B.L., C.I.E.
DEWAN OF MYSORE

DEWAN OF MYSORE

LAKE VIEW.
MYSORE.

17*th November* 1944.

I am very glad to hear that a Special Number of the Journal of the Mysore Agricultural and Experimental Union is proposed to be published on the occasion of the Silver Jubilee of the Union. For over twenty years the Journal has been doing useful work in disseminating knowledge of agricultural progress and has served as a medium for conveying instruction in a non-technical manner in improved methods of cultivation. Considering the added importance that the question of agricultural development has acquired in these days, the Journal has vast scope for rendering service of much practical value to our raiyats. I wish the Journal all success.

N. Madhava Rau

Dewan of Mysore.

RAJAMANTRAPRAVINA
H. B. GUNDAPPA GOWDA, ESQ., B.A., B.L.
MINISTER FOR LOCAL SELF-GOVERNMENT
AND PUBLIC HEALTH

PUBLIC OFFICES

Bangalore, 14th December 1944

It gives me great pleasure to send a message to the Mysore Agricultural Journal which is being run under the auspices of the Mysore Agricultural and Experimental Union, for over twenty-five years. The Journal has, by the publication of valuable articles and the practical results achieved on the Government and private farms in the State, been greatly helpful in the dissemination of up-to-date information on several subjects useful to the ordinary ryots. In our country where the conservative outlook of the agriculturist is proverbial, the need for such journals is very great and the Mysore Agricultural and Experimental Union has to be congratulated upon its sustained and successful efforts in running this journal. May this journal continue its useful service with ever greater popularity among the ryots and thereby serve the needs of the country.

H. B. Gundappa Gowda

Minister for Local Self-Government and Public Health.

GREETINGS TO

THE MYSORE AGRICULTURAL AND EXPERIMENTAL UNION

* * *

TELEGRAM

" *Congratulations and Best Wishes for Union Silver Jubilee*—COLEMAN "

* * *

LETTER

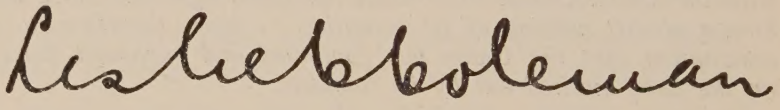
A request from your President that I write a few words in commemoration of the Mysore Agricultural and Experimental Union's Silver Jubilee has placed me in a rather difficult situation. My connection with the Union ceased more than ten years ago, and since then I have known almost nothing of its activities. I have, therefore, to go on the assumption that the Union has continued and expanded those activities on the lines marked out by its founders.

Some of the founders have been removed from participation in the Union's work by death and we should to-day be thinking of and honouring those men who played an important part in the development of Mysore agriculture. Others, like myself, have retired and have, perhaps, ceased to take as active a part in the affairs of the Union as they once did. Still others have left the State's service and are now utilizing their marked abilities in the development of agriculture in other parts of India. This is greatly to be regretted, for to lose some of the outstanding men from the comparatively small band engaged in the work of agricultural regeneration in Mysore is a very serious matter.

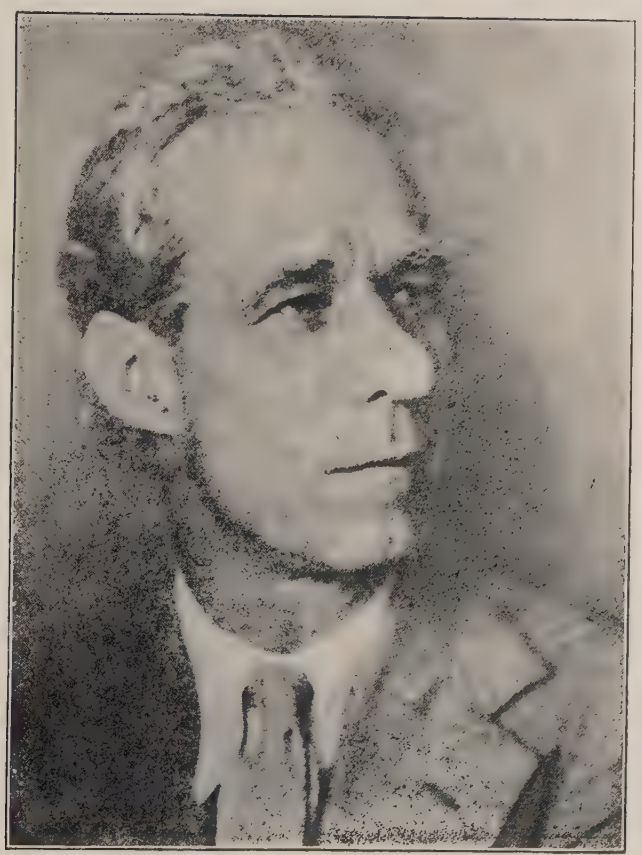
To me the most valuable function of the Union was, and I trust still is, the banding together of leading agriculturists in the State with Officers of the Agricultural Department in a common effort toward the devolepment of Mysore's main industry. Our annual meetings where important agricultural problems were discussed and our annual field days on one or the other of the Department's farms were among the most enjoyable and stimulating of my experience in Mysore. I am sure that these meetings have increased greatly in interest during the past ten years and that more and more of the State's leading agriculturists have joined in your deliberations and activities. In a State so preponderatingly agricultural as Mysore no means dare be neglected to unite agricultural officers with ryots and landholders in the common struggle towards a more informed, more progressive and more prosperous agricultural population.

To those friends, and I hope they are still not few in number, who may have wondered at my sudden and complete separation from all connection with Mysore, a word of explanation may, perhaps, be permitted. I have been in a position more or less parallel to that of the Hindu who feels, that to adjust himself to a new stage in his life's journey he must make a complete break with what has gone before and must turn his face to what is virtually a new life. As friends will perhaps remember, it has never been easy for me to keep from concentrating my whole attention upon the work in hand. That has also been the case since my return to my native land. If you at all remember me, please think of me as a sort of Sanyasi of Science, who, however, still retains all his human frailties, and looks back on the most active years of his life spent in Mysore with much pleasure not unmixed with some pain.

My greetings and best wishes to you all and my hope that the Union's second quarter century will make it an ever increasingly important factor in the development of Mysore's major industry.



Toronto, 25th November, 1944.



DR. LESLIE C. COLEMAN, M.A., PH.D.

DIRECTOR OF AGRICULTURE IN MYSORE (RETIRED)

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The Mysore Agricultural Journal

(The Organ of the Mysore Agricultural and Experimental Union)

Vol. XXIII] OCT.—DEC. 1944 [No. 2

Welcome Speech by Mr. M. J. Narasimhan, B.A. President of the Union

DEWAN-PRESIDENT, MEMBERS OF THE AGRICULTURAL AND EXPERIMENTAL UNION, AND GENTLEMEN,

It is my pleasant duty and proud privilege this day to extend to you all, on behalf of the Agricultural and Experimental Union, a hearty welcome. This is not the first time, Sir, that you honoured us by presiding at our Annual Meeting, and it is a great pleasure and a very great honour for us to be able to welcome you and to thank you for sparing your precious time on this our Silver Jubilee Day. Twenty-five years ago Dr. Coleman, the father of our Union, laid the foundations of this unique body which consisted of a few members who undertook to carry out co-operative experiments on their holdings, to test the recommendations of the Agricultural Department with special reference to their suitability to different areas. Dr. Coleman framed the working of the Union on the same lines as those of the Ontario Agricultural College Union, which had the same ideals before it, as those of our Union. Though, after twelve years of work the Union did not become the potent force that he expected it would, in the development of agriculture, it has undoubtedly stimulated interest in agricultural improvements in the State. It was this fundamental and pioneer work done by the Union which later took shape as Demonstration and Subvention Farms, now carried in a larger measure all over the State.

The criticism levelled by Sir John Russell, the British Scientist, when he visited India in 1936 that the fruits of laboratory research did not reach the ryots' fields, was not true as far as Mysore was concerned; for, 25 years before, Dr. Coleman had laid the foundations, by the formation of our Union, for " bridging the gulf " between the research laboratory and the ryots' fields. The foundation thus laid by the Union was later taken up by the Department with the enhanced staff of the Department. Government had throughout these years given recognition to the value and importance of our Union. His Highness the Maharaja of Mysore has been graciously pleased to give signal recognition to many members of this Union; to name a few,— Mr. Ooragahalli Krishna Iyengar, Mr. Sabbannahalli Lakshmana Reddy,

Mr. Santhehalli Venkataswamy Gowda and more recently Dharmaniratha G. Venkataramaniah who unfortunately passed away just a few days back. Never should we forget the name of Rajasevasakta B. Venkatanaranappa, for long the Vice-President of our Union, whose sad demise last year deprived our Union of its most enthusiastic co-worker and adviser. As Dr. Coleman himself with his usual frankness owned once, the idea of agricultural colonisation never entered his head, and it was Rajasevasakta B. Venkatanaranappa who first sponsored the scheme and enthusiastically worked for it.

During all these years the Union has been publishing a Quarterly English Journal and a Monthly Kannada Journal. With our increasing number of members in the State, we have thought of forming ourselves into Regional Committees and Village Associations.

The all important topic of the day is the increase of food production in the country in which agriculture, the " Cindrella of world planning and thought " as somebody defined it at the Hot Springs Food Conference, should play an important role. In spite of such a large area as 65·8 lakhs acres of cultivated land, we are unable to produce enough food for a population of 75 lakhs. With a population density of 1922 per square mile of cultivated area, enough food was produced in Japan for supporting the whole population, including industrial labour. In China where a farm of 2½ acres is said to support a family of 8–10 people, the density is much higher per square mile of cultivated area than here. Rural Mysore can be said to have a density of 648 per square mile of cultivated area. It is only by intensive cultivation and adopting of improved methods of agriculture that self-sufficiency in food can be achieved.

In order to solve this problem comprehensive plans for post-war agriculture have been prepared. In their Memorandum on Agricultural Development in India, the Imperial Council of Agricultural Research have gone into the question in great detail, and envisage the increase of staff by many times. In short, they have laid stress on Research, Experimentation and Education. The success of all this planning for better agriculture, however, depends, as the Royal Commission of Agriculture pointed out, on " the outlook of the peasant himself ". To quote, " We have endeavoured to make plain our conviction that no substantial improvement in agriculture can be effected unless the peasant has the will to achieve a better standard of living and the capacity, in terms of mental equipment and physical health, to take advantage of the opportunities which science, wise laws, and good administration may place at his disposal ". To this must be added the incentive to grow. How clearly this was gauged by our Dewan, when once before in 1935 he presided at our Annual Meeting, and said: " Our ryot is an opportunist and if you wish to improve his methods quickly, you must work on the lines of least resistance. Show the ryot that he can make money, give him facilities for cultivation and a market for his products and he will grow anything you want and in any manner you want."

For the successful carrying out of our post-war plan two things are essential; one is Research.

Discoveries in agricultural science, unlike some kinds of discoveries which readily excite the popular imagination, are slow to reach the ryots' field and soak in there. Moreover, the problems of agricultural research lie in the borderlands, where two or three sciences meet and hence complex, yielding slow results. There are already four freedoms enunciated for the post-war world. May I add a fifth, freedom for Research ! By this, I mean freedom from criticism of expenditure incurred on research, by non-experts who will not realise that results of research are not so periodic as annual harvests. Another consideration for promotion of research should be to give a living wage to the research worker, which however, does not mean the starveling price at which a graduate can be bought.

The other is Education of the people in improved agriculture. If this is to be materialised, local co-operation with the Departmental Staff will be necessary. It is in this that the Union can play a big part. The Regional Committees and Village Associations can be of immense help in carrying out the recommendations of the Department in the villages. Hitherto the Union has been a body which has been co-operating in carrying out experiments on the members' fields. In course of time the Union should extend its co-operation to the extension work of the Department. There will be greater chances of success in carrying out an organised programme, for, their influence in the villages is bound to be greater than the best efforts of the Departmental Staff.

I hope for a time when our Union will be able to take up the role played by the A. A. A. (Agricultural Adjustment Administration in U.S.A.). Its committee men provide each farmer facilities for his production effort. These are elected by the farmers themselves and give help in crop planning, marketing, etc. They even undertake a farm to farm, canvas and are local administrators for crop planning and even crop loans. They helped the local administration of price supporting measures, crop loans, seed distribution and manure supply. In short, A. A. A. Committee men, acting as a link between the farmer and the Department of Agriculture, practically help in co-operative farming.

I shall close by expressing our gratitude to you, Sir, in honouring us with your presence to-day.

Speech made by Pradhana Siromani Mr. N. Madhava Rau, C.I.E., Dewan of Mysore, on the occasion of the Silver Jubilee of the Mysore Agricultural and Experimental Union

25th November 1944

LADIES AND GENTLEMEN,

It was with great pleasure that I accepted the invitation of the Agricultural and Experimental Union to preside over its Silver Jubilee Celebration. If the average expectation of life of human beings in our country is low, the expectation of life of some associations of human beings is even lower. Many unions and associations go out of existence as suddenly as they come into being. Happily the Mysore Agricultural and Experimental Union does not belong to this category. For twenty-five years it has worked steadily but unostentatiously in furtherance of its object of improving agriculture in Mysore. It has endeavoured to bring together, for the benefit of the raiyats, the results of research and practical experience on the farms. Through the journals in English and Kannada which the Union has been publishing, it has been disseminating knowledge about remunerative crops and improved methods of cultivation. On the occasion of its Silver Jubilee the Union can look back upon a record of creditable work. It can also look forward to new and greater opportunities of rendering service of practical value to agriculturists in the State in future.

The fundamental problems of agriculture are fairly well known but nothing is to be gained by our simplifying them or complaining that progress has been slow. On the technological side, there is a vast field for research and the organisation is nowhere adequate. In another aspect, agriculture is not only an industry but a mode of life and any large developments must depend upon far-reaching changes in the economic and social structure and outlook. Attempts made to consolidate holdings and facilitate the adoption of large-scale farming have generally proved abortive. The indebtedness of the raiyats has not yielded to the familiar economic prescriptions, and in spite of some alleviation in recent years owing to purely adventitious causes, remains a serious stumbling block.

But outside the field covered by such perplexing problems, there is ample scope for raising the standards of agricultural production.

The agricultural departments in India, including our own, which has done pioneer work in many directions have accumulated scientific knowledge of great value. A part of it has already been translated into agricultural practice and the immediate task is to see that this process is rapidly extended.

In the course of our " Grow More Food Campaign " it became evident that the acreage under crops could be increased to a limited extent. No doubt, for the generality of raiyats the existing shortage of labour and bullock

power are real handicaps. But what is beyond an individual raiyat of limited means may well be accomplished by organised groups of earnest and experienced land-owners, pooling their resources and working together. Government are therefore anxious to encourage genuine effort in this direction by joint-stock companies, co-operative societies and bodies of educated young men ready to take to an agricultural career.

The prospect of increasing the out-turn of crops is distinctly encouraging. In a note on the technological possibilities of agricultural development of India published recently, Dr. W. Burns has assessed to what extent the yield of various important crops can be increased in the light of agricultural research so far made. His conclusions in regard to paddy, jola and sugarcane are of special interest to us in Mysore. He finds that the average out-turn of paddy can be increased by a minimum of 30 per cent. rising to 50 per cent., that in regard to jola an improvement of 20 per cent. is possible, and that the present average yield of sugarcane which is about 15 tons per acre can be increased to 30 to 55 tons per acre. Our own experience in the farms of the Agricultural Department and the experiments conducted in the rayiats' fields indicate similar and even greater possibilities.

It is common knowledge that judicious manuring improves the yield of crops. And some of the manures can be had easily and at no great cost. The practice of raising green manure crops needs to be popularised. Honge trees can be raised by raiyats without much trouble on the boundaries of their own fields or as separate *topes*. The manufacture of compost, utilising town refuse, has been tried for some years by the Mysore City Municipality and has latterly been introduced in a number of smaller municipalities. It is intended to popularise the making of this useful type of manure in a large number of villages.

Some of you, gentlemen, have been pioneers in your districts in using manures not only of the cheaper varieties I have indicated but also concentrated fertilisers and are in a position to appreciate their value. You have also seen the benefit of using improved varieties of paddy and ragi seed, not to mention the less common commercial crops. These obvious and tried methods of improving yields must be brought home to all raiyats not only by your silent example but by aggressive demonstration and propaganda.

Government, for their part, realise that intensive efforts should be made to the same end by the agricultural staff. For some years at least the officials of the department must continue to procure the requisite seeds, manures and instruments and distribute them through Government depots. But it is hoped that the time is not far distant when private agencies will take over this part of the department's work and leave the members of its staff free for more appropriate duties.

I am much interested to learn that you are constituting Regional and Village Committees to serve as study groups. That is all to the good but may I suggest to you a more ambitious plan? You should form District

Agricultural Committees, each with a definite programme, adequate funds voluntarily raised in the first instance, and a proportion however small of live members. These committees would supply a real liaison between the Department and the local agricultural population and if they function well they may, in time, prove to be the nucleus or important branches of properly constituted District Economic Councils which will have a voice in the shaping and execution of measures for promoting the economic welfare of their districts.

It is only in recent years that agricultural marketing has received serious attention. A number of surveys have been made and a good deal of information has been collected with regard to the marketing of agricultural produce. As a means of eliminating abuses in trade and ensuring a proper share in the ultimate retail price to the grower, regulated markets have proved helpful. In our own State, a project for a regulated market at Davangere has been sanctioned and is under way. The opening of similar markets at Tiptur and elsewhere is under consideration. A few marketing co-operative societies have also come into existence and are said to be doing good work. But nearly all of these organisations are concerned with cash crops which are grown in certain parts of the State by a limited number of people. As regards general food crops, which form the bulk of agricultural production the marketing methods are primitive and, so far as the cultivator is concerned, far from advantageous. The monopoly purchase of surplus food grains by Government in the present emergency has incidentally protected the raiyat against exploitation but the time must come sooner or later when grain trade through the usual channels will revive. The need for organised marketing remains, therefore, a matter of essential importance.

Meanwhile, we welcome the decision of the Government of India to keep up the prices of important food grains at reasonable levels for a period of years. No single factor can conduce to agricultural progress more than the guarantee of a fair price and if, as seems likely, this can be ensured by international action, the fears of a possible agrarian depression in the post-war years will be allayed.

Closely connected with crop production is the question of improving agricultural livestock. It looks as if we have much to learn and something to unlearn in this sphere. But some of the experiments made and schemes tried in the past are not without their lessons, even if they be lessons of a negative character. The Board of Agriculture have studied various proposals for improving the local breeds of draught as well as milch cattle and some of their recommendations are under the active consideration of Government. A special problem that needs instant attention is to augment the milk supplies of Bangalore and other towns which are feeling the pinch of acute milk shortage. Government have sanctioned the establishment of three sheep breeding stations and a substantial start has been made with work on the development of fisheries.

I should like to take this opportunity of stressing the importance of developing the cultivation of vegetables, particularly in the countryside. It is said of the British farmer that if God Almighty gave the whole earth to him for farming he would still want a bit outside for a potato patch. It would be worthwhile for our raiyats to develop this attitude. It seems necessary to undertake propaganda for extensive cultivation of vegetables and also for their consumption in the villages. If our villagers learn to grow as well as to eat more vegetables, they can supplement their income and also improve the nutritive value of their diets.

In earlier years, scientific work on Indian agriculture was stimulated as a result of periodical famine. This war, with its varied experiences transcending those of any famine, has made the country realise more vividly than ever the importance of agriculture in our national economy and in this realisation lies the hope of a new era of development that will brighten the peasant's home and environment.

I wish to thank the members of the Union for having given me this opportunity of participating in the Silver Jubilee function and to express my hope that the Union will play an increasingly useful part in evolving a better and more efficient agricultural order for the State in the days to come. It is a matter of gratification that your membership is increasing at a rapid rate, that among your active sympathisers you can count persons like Mr. A. K. Yegna Narayana Aiyer and Dr. B. Narasimha Iyengar who have done yeoman service in the cause of agriculture and that you have received a special message of congratulation from the first Director of the Department, Dr. L. C. Coleman, who is remembered with affection by a large circle of friends and with gratitude by the agricultural community of Mysore.

Some Reminiscences of the Mysore Agricultural and Experimental Union and Its Journal

I have been asked to contribute an article to the Silver Jubilee Number of the *Journal of the Mysore Agricultural and Experimental Union* recounting my reminiscences of the Union and of its Journal and although it is now about ten years since I retired from the Department and much has taken place during this period with which I am not fully conversant I have agreed to do so if only to express my sincere gratification that the Union and its Journal should have prospered so well as to celebrate their Silver Jubilee. I must however say that as far as I can remember neither the Union nor the Journal has passed through any turbulent times, shared any perilous adventure or had any sudden accessions of fortune or any serious mishaps, such as may furnish material for any high-flavoured reminiscences. They have had a fairly even tenor of existence somewhat monotonous perhaps but let us remember the saying " happy the nation that hath no history " and take it that it applies equally well to institutions of this character also. Still such as it is, I may pick out a few salient points here and there and hope they may interest you.

The first one I shall refer to is the very origin of this Union. If I remember right, the idea was to have a kind of service union of the agricultural graduates in the department which would safeguard and promote their interests, while at the same time affording them opportunities of improving their technical knowledge and experience. Dr. Coleman, when the matter was placed before him, while agreeing to the idea of starting a Union, gave a totally different turn to its aims and objects and I must say that this was a master stroke, which has been chiefly instrumental in keeping the Union alive and prospering, which has saved it from the storms of personal rivalry or conflict of interests and which has raised it to a serene sphere of useful service, pure and simple. In defining its aims and objects there has been another noteworthy consideration which has also contributed to the permanence of the Union. Not very long prior to that time the subject of Agricultural Associations was very much in the air and the starting of such associations was a favorite method of trying to achieve progress in agriculture. Many such were started all over the country but experience soon showed that working them was not so easy as starting them. Most of them languished. An occasional meeting would be held when someone delivered a lecture more often than not to almost empty benches; the more ambitious ones perhaps would run a short-lived journal and in the best of them some keenly interested member conducted some trials and reported results. They suffered from many handicaps, the most important of which was the lack of definite work for the members. The times too were not propitious, there

were few scientific workers, there were no promising experiments or trials which could be recommended and there was no intimate connection or backing from the agricultural departments. It was the anxiety to avoid these causes of decay from overtaking this Union also that its objects were defined in the manner chosen. There was the department to help, there were already quite a number of results which needed to be tested on ryots' fields and more were in sight, so that there was work for the members, definite and clear-cut, and therefore this root cause for a possible languishing was removed. The Union was of help to the department inasmuch as its members tested the correctness or applicability of their results, so that in this alliance based upon mutual helpfulness the Union has found its chief element of strength and permanence. Both name and objects are after the Canadian model with the good work done by which organisation Dr. Coleman was well acquainted personally.

The Union in this way forms an important, perhaps the most important, link in the chain of organisations for transferring the results of scientific investigations to the field of the ryot or in " bridging the gulf " as this process has come to be known now. To the members of the Union was assigned the task of conducting trials of these results almost in the manner of experimental farms, a task which only a distinctly special (I will not say superior) class of persons can undertake. It is worthy of note that a large number of such trials was conducted and reported upon by our members without—I will stress this point—looking to or receiving any financial help from Government. All the more credit to them, when you contrast this record with the present " Subvention Farms " and the expenditure thereon. The idea of the subvention farm is very old, at least 40 years to my knowledge in Mysore. There is an old Government Order of the year 1904 or thereabouts when in sanctioning the starting of an Agricultural and Industrial Association in Bangalore, Government originated this idea and laid down details of the amount to be paid, the work to be done, the method of payment and so on. You may look it up, if at least out of curiosity. Not only was this known to us but the question of subvention was also mooted in the Annual meetings; but we adhered to the unpaid voluntary system and the members heartily co-operated. Perhaps we could have done more with the help of subventions but our members preferred a higher plane.

Their work has resulted in popularising definite improvements not only in their immediate neighbourhoods but also much farther afield. There were many members carrying on this kind of work; they were not " big noises " in public life, they did not figure in the Representative Assembly or other such bodies; they did not hanker after or angle for honours or publicity; they were keen agriculturists and did the work for the pure love of it. When I recollect some of the many-sided and elaborately laid out work of some of these members, quite far too much for their pecuniary standing, I am both delighted and astonished. I can recall many names among which are also

some of the first passed students of the Agricultural School, but I refrain from mentioning them lest I commit the unpardonable fault of omitting any.

The annual meetings of the Union were most interesting gatherings and at this distance of time and with the crowded experience of my post-retirement activities I look back upon them with pride. Many important questions were discussed, many suggestions of a practical nature were made, methods of introducing and popularising particular improvements were discussed from all angles, valuable criticisms were offered in the most friendly and fearless manner; and if you remember all these were from men who were going to be directly affected by any measures which may be decided upon, their value is many times enhanced. The meetings were of invaluable assistance to the department and to the agriculturists of the State in general. Time and again, Dr. Coleman acknowledged this service most handsomely and appreciatingly. Let me accord on this occasion my own humble but hearty meed of well-deserved praise to them all.

I shall now particularise some of these subjects, which stand out prominently in my memory. The "*Mysore plough*" came in for much helpful criticism and suggestions, in the light of which alterations were made from time to time before the design was finally decided. The discussion on the subject of *well-sinking* prior to the organisation of a well-sinking section in the department was full and eminently practical, with many of the working difficulties anticipated and provided for. It will not be an exaggeration if I say that this support had much to do with the readiness of the Government in sanctioning the scheme. The same was the case when measures to remedy and cope with the *fodder distress* situation during the terrible fodder famine years of 1922–1924 were decided upon. The relief campaign which was organised was unique in character. It involved many novel features such as the opening of straw sale depots in the affected tracts, the transport of straw from far-off Mysore, the marching of cattle to the malnads and the opening of camps along the route, the cutting and baling of malnad hay and transport to the affected districts, the opening of numerous prickly pear feeding camps, the growing of green fodder in the channel tracts and so on; every aspect of the scheme was arduous and very responsible in character and thoroughly unlike anything which agricultural officers were wont to or qualified to do. I have always considered it a triumph and a great achievement for a small agricultural department to have put through, though I grieve to say it all went down 'unhonoured and unsung'. Every detail of this complex organisation was discussed at the meetings and valuable working suggestions were received, and later active co-operation in the working of the campaign in the districts. Another important subject discussed relates to the *improvement of live-stock*, both cattle and sheep. The supply of breeding bulls, places and persons eligible, the raising of fodder crops, cross-breeding of local sheep with merinos, formation of pure herds and so on, were discussed in great detail and many members later participated

actively in the schemes and were themselves able to assess the value of their suggestions.

The idea of forming *colonies of agriculturally trained students* also originated in the Union itself, though this was from the members of the departmental staff; many details were worked and the Bhadravati Colony was started. As is well known this did not fulfil expectations and has come in for much adverse criticism not unmingled with ridicule; but it has nevertheless served to strengthen the move and has led to the opening of more colonies. The idea was thus demonstrated to be correct and worthy of active support. The start was the great thing in a matter of this kind and that, the Union achieved. The practical difficulties which were rather peculiar to the local conditions could not be foreseen at all and became apparent only after the work actually began and progressed for some time. The experience of Bhadravati though it has been costly has lighted up the path for the later undertakings and this at least should be added to the credit side.

The question of the profits of farming was another subject the Union took up. This was much too ambitious and I think it did not advance beyond the paper stage. This is not to be wondered at, if you remember the organisation and the great cost of a similar scheme started by the Imperial Council of Agricultural Research to ascertain the cost of cultivation of only two crops, *viz.*, cotton and sugarcane. It is however a very important subject and must be pursued, so that we may be able to give a correct numerical expression to the earnings of the land-owner and the worker on the land as compared with those of the men employed in factories or offices. Wages ought to be proportional to effort, whether mental or bodily, whether on the field or in the factory or in office chair. The overwhelming disparity that now prevails (not in India alone but throughout the world) between what the producer of the primary needs of mankind obtains for his effort as compared with men in other walks of life is a permanent cause of economic disturbance and has to be flattened out if only to remove this danger, putting aside the ethical aspect of it. This is a large question and I shall not digress.

There was again the subject of *enlisting co-operative societies in the stocking and sale of improved implements, seeds and manures* to foster which the department took great pains and sought the advice and help of the members of the Union. The object was mainly to multiply the selling organisations so as to bring them within easy reach of the villagers and gradually to pave the way for an intimate grafting of agricultural improvement in the villages on to the Societies, and incidentally to set free the Agricultural Inspectors for the technical work of demonstrations, advice, inspection, etc., for which they had been specially trained. A variety of interesting methods have been tried and valuable suggestions were always received from members. Successive Registrars approved of the idea of this alliance and our late lamented friend Mr. K. H. Ramiah not only smoothened many difficulties but generally attended our meetings and brought his thunderous eloquence

to bear upon the advantage of this work and we all know that once the floodgates of his harangue were opened it carried everything before it. We always looked forward to this treat at our meetings.

Now I come to the Journal of the Union which perhaps has some history, in the sense that it has had a chequered career with many ups and downs, more ' downs ' than ' ups '; at any rate it was so for many years. I am told all that has changed now and that it is enjoying a prosperous time. I am delighted to hear it. Among other things the Journal was the outward and visible symbol of the Union, it kept the flag flying, so to say, throughout the year, for the real work of the members during the year came to light only at the end of the year at the annual meetings. I was its first Editor and continued in that capacity for the first three years. It was an ambitious venture but in the beginning I was fortunate enough to secure writers of great eminence to contribute. Sir James McKenna, Director of the Pusa Institute, and Prof. Gilbert Slater, the Economist, were among our first contributors. This level could not be kept up always; articles were difficult to get. A fellow-officer of the Madras Department to whom I wrote, replied very encouragingly and warmed up my hopes saying he was waiting for the inspiration to come on him, but froze up immediately after by saying the first claim would be his own departmental journal. That was the kind of reply usually got, nice and polite but nothing doing. I was always hard up for articles but pulled on somehow and during those three years did succeed in bringing out the journal in time. Later, we fell on bad days and the malady became chronic and cumulative, and we either wrote off arrears or had to adopt the method of bringing out twin numbers and catch up time. Very early in its career we saddled it with a pick-a-back companion, *viz.*, a Kannada edition, and were then fairly up against a sea of troubles. Slow as the English edition was, the Kannada was slower; we had to reckon with the translator's worries; it was no easy matter to render the semi-scientific English articles into Kannada which could be understood without a further commentary, and though the translator wrestled hard and did his best, it was nowhere near scheduled time. And then came the question of subscribers for the Kannada edition. It was never encouraging, the edition became a serious drag and not all our resourcefulness or all the furious thinking could pull it out of this serious plight. And that forces me to say—not reproachfully but only regretfully—that all this talk about vernacularising education is not serious; perhaps it is too hesitant, I should say. People are afraid to face the consequences; really they feel that their children's prospects in life may be jeopardised, the unity of the country brought about by the English language may be threatened, that the scientific and industrial progress may be retarded and so on; such considerations largely neutralise their ardour for the vernacular. The glamour of English offers an irresistible temptation and even in our Union meetings men who could speak with force and ability in Kannada generally preferred to address in English. Matters have not improved with time, at

any rate sufficient to change the fortunes of vernacular journals. I continue to edit an English Journal even now and also issue a Kannada edition, but about the circulation of this edition, I should prefer to draw a veil. To go back to the Union Kannada Journal, we often sat and considered many methods of improvement but always came to the same conclusion. We then enacted one of those funny dramas you may have read about. We resolved to appeal for Government help; Dr. Coleman, the President of the Union, recommended it to Dr. Coleman, the Director of Agriculture, for favourable consideration and this officer strongly supported the President's proposals and submitted them to Government; then the benign Government sanctioned a grant. We enacted this drama more than once, if I remember right, and every time with the same excellent result.

And that brings me to the part played by Dr. Coleman in the affairs of the Union. He took a deep personal interest in it and strove to make it really useful. He was its great friend in need and always a tower of strength. Later, he was anxious to see it placed in the hands of a non-official President. I remember at one of the annual meetings he left his presidential chair to the Vice-President and, stepping down into the forum, proposed a non-official President and explained the advantages. Needless to say, the House did not agree. He loved the Union and the Union reciprocated. Now let me close this somewhat long string of reminescences on this personal note.

A. K. Yegna Narayana Aiyer.

Recollections of My Association with the Work of the Union

My asosciation with the Union began in September 1919 when I had just returned from Germany and been appointed Agricultural Chemist. The existence of such a body in Mysore was a pleasant surprise to me after having seen the splendid work of similar long-standing organisations in Germany, Holland and England. As everyone knows, the Union owes its origin to the farsightedness of Dr. Leslie C. Coleman who gave his best to Mysore agriculture during the period of 25 years of service in Mysore.

My active association with its work began with the reading of a paper on " Agricultural Production in Germany " at its annual meeting towards the close of 1919. As time went on, I had to plan out manurial experiments to be carried out by its members. The first series of experiments related to the trial of ammonium sulphate for sugarcane. This went on for a number of years in all the districts and was attended with conspicuous success. Other manurial trials were with paddy, ragi and mulberry. A few trials have been conducted in some years with areca and coffee as well. As a result of all such trials, artificial manures are now becoming more and more popular.

These trials differed materially from the subvention farms started by the Department of Agriculture in recent years. Cash subvention was not even thought of, and the only concession that members got from the department was a free supply of manures and seed limited to a maximum of Rs. 15 and Rs. 5 respectively in value.

The most enthusiastic members who took part in that kind of work were Messrs. B. Venkatanaranappa, Hongenahalli Srinivasa Rao, Santehalli Venkataswami Gowda, Hampiah of Sidlaghatta, Venkatasubba Chetty of Nelamangala and a number of others whose names I do not unfortunately remember.

Equally good work has been done by members in the trial of ragi varieties and the testing of the Mysore plough.

It has recently come to my knowledge that the Union has now over 800 members on its rolls, and has even started to form taluk associations. The formation of taluk as well as district associations has long been the ambition of the originators of the Union and it is quite gratifying to see that the ambition which was only a dream during my period of active association in its work is now showing good signs of becoming a reality.

Another item of work connected with the activities of the Union, was the publication of its Quarterly Journal, the first editor of which was Mr. A. K. Yegna Narayana Aiyer. Owing to the formation of an Editorial Board in 1921 or 1923, the responsibility of conducting the journal devolved on me as its Chief Editor. It was not an easy task to secure contributions so that the journal could be published punctually. In spite of some drawbacks and

difficulties, I continued to hold that office till 1935. During my editorship, Dr. Coleman himself was a very frequent contributor and his articles had a very exceptional value. A periodical account of every item of valuable work was contributed by heads of scientific sections, district officers, farm managers and private gentlemen as well. For some time, the querry column of the journal was a peculiar feature. A lot of controversy took place at one time on "What is an Economic Holding" in which the late Dr. K. Kunhi Kannan and Mr. N. Rama Rao took a very active part. Maintenance of farm accounts, formation of Agricultural Colonies, fodder situation in the country and other similar subjects formed items of general interest discussed in the journal maintained.

What the Union has accomplished till now is very little compared to what it has to do in future. After all, progress in agriculture cannot be a spectacular one, though there may be spectacular results here and there. May the Union grow stronger and stronger year after year, make slow but sure and steady progress, and fulfil its duty towards agriculture in the State by marching on the lines of progress indicated by its first President Dr. Leslie C. Coleman and the band of workers associated with him.

B. Narasimha Iyengar.

Greetings from Holy Kasi

I have great pleasure in sending my greetings and good wishes from the banks of the holy Ganges to the land of the holy Kaveri. May the Mysore Agricultural and Experimental Union flourish and render useful service to the country in future as it has done in the past.

You all gather together to celebrate the Silver Jubilee of the Union on the 25th of November 1944 but my memory looks back to a much more distant time. It was some time before the last Great War that a handful of us met under the cool shade of a spreading May-Flower tree in a rose garden with beautiful beds all round us to discuss the possibilities of organising an Agricultural Association in Mysore. I can clearly visualise now how our venerable Mr. D. G. Ramachandra Rao presided on that occasion and how we all formed ourselves into an association. Time passed quickly. The ravages and uncertainties of war stunned all activities but the young Agricultural Department was growing vigorously. On the return of Dr. L. C. Coleman from Canada a new vitality was poured into the agricultural activities in the province. The result of all discussions, conferences and planning was the inception of the Mysore Agricultural and Experimental Union 25 years ago. The baby that was born soon after the great victory is now entering the stage of full manhood on the threshold of a greater victory. May the future years bring plenty of prosperity and unalloyed peace to our motherland.

For a long period of twenty-six years, I had the honour and privilege of being closely connected with the affairs of the Union. We passed through periods of depression and anxiety. Happily the Union has weathered them bravely with the support of a sympathetic government and a co-operating public. The spread of scientific ideas in agricultural improvements and the enthusiasm shown by the people to experiment, to investigate and to improve, bear testimony to the service rendered by the Union to the country. Lest we forget, let us pay homage to the great President Dr. Leslie C. Coleman, to whom the whole country owes a deep debt of gratitude. May we not flash a message of our deep sense of gratitude to him? More of him anon. Should we forget the genial old Mr. Hongenahally Srinivasa Rao who was always experimenting and taking a keen interest in our work? What then of our revered professor Mr. Venkatanaranappa who rendered so much valuable service to the Union. The Union can never be sufficiently thankful to him. There have been silent workers scattered all over the country and our grateful thanks are due to them on this occasion.

The development of sugar industry in Mysore has added a brilliant chapter to the industrial regeneration and development of India. It has shown what great achievements can be attained by vision, planning and

scientific work. Is this not the occasion for us to pay homage to Dr. Coleman by having a statue of his in the gardens of the Sugar Company at Mandya and endow suitably a sum to grant scholarships in his name to stimulate Agricultural research? Mysore has always been a grateful country and I am confident it will not fail to show its appreciation of that great man on this occasion in a fitting manner.

The problems before us are many. The population is adding up one town of 50,000 to the province every year. Sufficient and nutritive food has to be provided for to build and maintain a healthy vigorous nation. Mysore has to play its part in the great future of our motherland. In that work our Union has to play a great part. May it prosper and play its role in a befitting manner is the earnest wish of all those who are far away but whose hearts are ever throbbing in unity with those at home.

V. K. BADAMI.

Brief Report of the Union by Mr. S. Srinivas, F.R.H.S. Vice-President

DEWAN SAHEB, LADIES AND GENTLEMEN,

It is my pleasant duty to place before you a review of our Union on the occasion of its Silver Jubilee. Dr. Coleman and his colleagues founded this institution in 1918. The articles and speeches of his in the previous issues of the Journal, the speeches of the distinguished chairmen who presided over the annual meetings, and writings from several authors who contributed to its pages, provide a substantial reading and define the scope and ideal of the organisation.

Remembrance.—Of those who used to be seen on the Union platform, time has claimed for itself such personalities like Dr. Kunhi Kannan, Dr. M. K. Venkata Rao, Prof. B. Venkatanaranappa, Mr. Hongenhally Srinivasa Rao, Mr. M. S. Ramachandra Rao and Mr. Siddalingadevaru. It is with great regret we learn of the sad demise of Dharmaniratha G. Venkataramaniah only a few days ago. To his munificence we owe the establishment of the Sri Rama Krishna Krishi Sala, and he was a patron of several institutions. His Highness the Maharaja of Mysore conferred the title of Dharmaniratha on him recently and we had cherished great hopes of having the gentleman in our midst on the happy occasion of the Silver Jubilee of the institution which he served for a long time as a member of the Committee of Management. Meanwhile, Providence that rules over the destinies of men claimed him.

We must express our gratitude to the Presidents, Chief-Editors, Deputy Directors of Agriculture, and the whole group of friends who have put their hands to the lever and whose inspiration has led the Union thus far.

We are happy that recently, His Highness the Maharaja has conferred the title of Rajamantrapravina on Mr. H. B. Gundappa Gowda, B.A., B.L., Minister for Local Self-Government and Public Health, who is in charge of the Agricultural Portfolio. We convey our heartfelt felicitations to our Minister.

The Activities of the Union.—The activities of the Union hitherto have been threefold: (1) publishing its journals, a quarterly in English and a monthly in Kannada, (2) arranging annual Field-Days, and (3) bringing about co-operation between the Agricultural Department and the members for the conduct of experiments with improved seeds, manures and implements on the members' holdings and publishing the outstanding results. The annual meetings have on various occasions consisted of three distinct phases: (*a*) observations of crops and livestock on selected Government Experimental Farms, (*b*) exhibitions and, (*c*) discussions and symposiums. Referring to previous records, there have also been attempts to form

District and Taluk branches of the Union, to intensify the work of the association in the districts.

The last meeting.—The last, *i.e.*, the 24th Annual Meeting and Field-Day were held in the month of March 1944, at Hebbal, presided over by the Minister for Public Health and Local Self-Government.

Strength of the Union.—Since that meeting, thanks to the enthusiasm of Mr. M. J. Narasimhan, Director of Agriculture, who has been our President, and Mr. K. H. Srinivasan, the Deputy Director of Agriculture, and the other officers of the Agricultural Department, more and more members are being enrolled, with the result that our Union has been growing from strength to strength day by day. The number of our members has now increased from 363 to over 1,200.

Taluk Committees.—With the increase in membership it was thought opportune to form Regional Committees and thereby bring a closer contact among the members in a locality. We made a fresh beginning. A meeting of the members of the Mysore Taluk was held in the Office of the Senior Assistant Director of Agriculture, Mysore Circle, during the Dasara and a Committee was formed for that Taluk.

Village Associations.—The Union provides for formation of affiliated associations in its rules, the practical utility of which is to help small groups of agriculturists, more or less on the model of study circles, and create a scope of definite work in a particular place as a result of the limited group of friends coming into contact almost daily. About a dozen such affiliated associations have been formed in Shimoga and other districts recently.

Life-members.—It was resolved in the last meeting that a life-membership should be constituted on the basis of an individual subscription of Rs. 100. Accordingly two gentlemen, Mr. A. C. Mallegowda, Member of the Legislative Council, and Mr. B. V. Venkatacharya, B.Sc. (Ag.), have become our life-members upto now. We thank them for the example set.

We have thus an inheritance, and the development during the recent period has shown us the direction in which we can move. We can feel according to the advice of Rajamantrapravina H. B. Gundappa Gowda, presiding over our last Annual Meeting, that the meetings of the Union are proper occasions to exchange views and formulate plans for future work. Two requests are however still pending before our benign Government, *viz.*, (1) our prayer to consider the Union as a constituency and give it a representation on Government Committees constituted for economic affairs, such as Board of Agriculture, etc., and (2) the prayer to raise our Subvention from Rs. 2,000 to Rs. 3,000 per annum.

Future Work.—I may now be permitted to say a few words about our future work:—(1) We want more space for our Central Office. Not only we would like to see the office sufficiently staffed to deal with the increased membership but that the increased space we are asking for is capable of

being developed into a study room for students of Agricultural Economics and an agricultural museum. (2) The idea of a Union Home was suggested quite a number of years ago as we see from the records and we would feel happy if it should materialise. (3) We should at once set towards the formation of more Village Associations and Taluk, Hobli and District Committees all over the State. (4) Ways and means have to be found to see that Model Farms, with a view to trying only proved seeds, manure and implements, are established to provide a centre of activity for these local organisations; and within this co-ordinated organisation, (5) create a scope for getting up exhibitions of crops grown by members, issue of small books on definite agricultural topics and crops, and such other details.

Liberal help from Government and extended sympathies of the Agricultural Department ought to take us a long way in our programmes, small and large.

The Chemical Section

The Section of Agricultural Chemistry may rightly claim to be the oldest unit of the Department of Agriculture, having been started as early as 1899 with Dr. Lehmann as Chemist in charge of all agricultural work in the State. With the formation of the Department in 1914–15, the Section emerged in its present form as one of several research bureaus and attained its full status with the appointment of Dr. B. Narasimha Iyengar (later Director of Agriculture) as the Agricultural Chemist in the year 1919. By a happy coincidence, the Agricultural and Experimental Union also saw its birth in that year and the Section has thus had an immediate opportunity of testing the results of research on the ryots' fields. This period also coincided with the end of the first Great War when rapid and far-reaching changes in agricultural practice were being introduced all the world over, based on useful investigation and experience gained under the stress of belligerency.

Dr. Lehmann had, with considerable foresight, laid down the fundamental lines on which research in the several problems connected with our soils and crops should be conducted and the manner in which the results should be conveyed to the landowner. While adhering in the main, to these precepts, Dr. B. Narasimha Iyengar during his long period of office as the Agricultural Chemist for over 16 years, made such alterations and modifications as were necessitated by the changing needs of the times and the rapidly improving standards of agricultural research. Moreover, laying a greater stress than before on the need for the study of the crops and soils in their natural environments, he instituted the system of field experimentation as an invariable complement of laboratory trials.

The period under review also saw the emergence of two important factors which greatly influenced agricultural research in India. Firstly, the establishment of the Imperial Council of Agricultural Research with its policy of technical and financial co-operation with the States and Provinces gave to local investigations a place in an all-India scheme of work. New investigations were started as part of an all-India scheme of work or as complementary to work done on similar problems in other parts of the country. A few of these investigations for the conduct of which special facilities existed in Mysore, were undertaken with the usual financial co-operation of the Imperial Council of Agricultural Research. Secondly, the advantages of applying statistical methods to experimental agriculture began to be increasingly recognised, and all new investigations were started in accordance with the rigid standards required by this technique.

In Mysore itself during this time there was a rapid extension, both in volume and variety, of work connected with the several aspects of agriculture. The increasing use and apparent success of quick acting inorganic fertilisers

in other parts of the world, created a demand for these products, and it became necessary to re-examine the manurial requirement of our crops with special reference to these fertilisers. The opening of the Irwin Canal brought over 120,000 acres of dry land, most of which was practically virgin land, under irrigation and problems such as systems of irrigation and crop rotation and manure supply suitable to the tract had to be tackled and solved. The establishment of the Coffee Experimental Station at Balehonnur helped to place investigations on coffee on a systematic and firm basis and made it possible to undertake accurate studies on the many aspects of coffee cultivation. Finally, the introduction of cigarette tobacco and long and medium staple cottons for general cultivation in the State necessitated an extensive survey of lands suited to these crops and the conditions favourable for their cultivation.

These are some of the factors which have influenced the work of the Section during the past 25 years, which may be divided roughly into the following categories:—

(1) Studies on soil crop relationships. (2) Soil surveys and other soil studies. (3) Study of factors influencing the quality of agricultural produce. (4) Conservation of wastes and by-products and their economic utilisation. (5) Chemical and bio-chemical aspects of prevention and control of diseases and pests.

These are dealt with briefly in the following pages :—

Studies in soil crop relationships.—The ultimate object of this type of investigation is to raise the fertility and productive efficiency of agricultural land to the maximum profitable extent. This it is sought to do by a careful study of the nature of the soil, the crops for the cultivation of which it is best suited, and the manurial and other treatments to which it readily and profitably responds. The investigation involves three aspects of enquiry, namely, (1) the study of the soil in the field and the laboratory, (2) pot culture studies, and (3) large-scale field trials.

Extensive investigations in these directions have indicated that compared to world standards, the productive efficiency of our lands is of a low order, being just under 50% of those standards. This is all the more so with the red soils which form the major portion of our arable land. Fortunately, this low fertility is not due to any inherent defect in our soils but to a continued state of undernourishment and often no nourishment, combined with indifferent cultivation. It is found that this state can be vastly improved by a judicious system of manuring, cultivation and crop rotation.

From critical studies in this direction for wet and dry crops in the pot house, on plots and on Government farms in representative areas of the State, it is observed that as in the rest of India where similar conditions exist, the soils are generally poor both in organic matter and nitrogen, comparatively low in phosphates, and usually well supplied with potash and lime.

The need for nitrogen varies from as high a figure as 300 to 400 lbs. to the acre for sugarcane to as low as 16 lbs. per acre to ragi and a maximum of 30 lbs. to paddy; that for cotton varies from 50 to 100 lbs. according to the variety and that for tobacco from 16 to 24 lbs.

Using these optimum quantities it is possible to obtain as high yields as 40 tons to the acre of sugarcane, 15 pallas of paddy, 6 to 8 pallas of ragi, 500 lbs. of cotton and at least 4,000 lbs. of tobacco.

It is also observed that in the case of sugarcane, paddy and similar crops responses to phosphates are neither uniform nor conclusive so far as yields are concerned. Nevertheless from the standpoint of physiological equilibrium and soil fertility status, it is found advisable to apply 50 lbs. of P_2O_5 to sugarcane, and at least 8 to 12 lbs. to paddy and irrigated ragi. On the other hand, cotton, tobacco, coffee and other garden crops do definitely show a response to a phosphate application varying from 25 to 50 lbs. to the acre. Equally so is the need for potash for these crops. The curing quality of tobacco and the setting of the coffee blossom to berry are both seriously affected for want of potash in time.

As a result of these studies it is now possible to prescribe with a fair amount of precision the plant food requirement of the major crops grown in the State. It is further to be observed that the major portion of these plant foods upto 75% of the total can be supplied in the form of locally available bulk manures like farmyard manure, compost, green manure, oilcakes, bone and bone products and ashes. A judicious admixture of chemical fertilisers with these ensures a good return of crop under normal conditions.

The advantages of using locally available bulk manure cannot be over-emphasised for not only do they save on capital outlay and running expenditure, but add the much wanted humus to the land and improve its quality and productive efficiency. It is a matter of common knowledge that with the use of green manure alone a 20% increase of crop can be obtained with paddy. When fortified with concentrated manures this can easily be doubled. Similarly with the other irrigated crops. It may however be a matter of interest that green manure acts equally efficiently even on rainfed lands, increases in crop being of the order of 50%. Moreover, this crop seems to be more drought resistant than the one grown in the usual manner with indifferent applications of farmyard manure alone.

It may be added that, of recent years, an erroneous view seems to have gained strength that the use of concentrated manures and fertilizers alone are sufficient for crop production. It should be stated most emphatically that on Mysore soils at present, such a procedure would be inadvisable and may be dangerous. Any application of these manures should definitely be as an addendum to a liberal application of bulk manures like farmyard manure, composts, green manures and similar products.

Garden Crops.—Garden and plantation crops require the application of a well balanced manure containing all the three elements—Nitrogen, Phosphorus and Potassium. Systematic manuring tends to improve the yield, reduce the difference between lean and bumper years and helps in the formation and ripening of fruit. In the case of areca, application of concentrated manures once in three years is found to be adequate, provided the usual cultural and protective operation and application of bulk manures are carried out every year.

Periodical liming of garden lands—specially coffee estates—is found to be beneficial. It has been observed that an acid reaction of the soil is detrimental to the growth of the coffee plant and the periodical liming of the estates helps to keep the land in the correct condition. It must however be remembered that over-liming is as injurious as an acid reaction of the soil and it is best that the soils are got periodically examined by the Department and liming undertaken in the light of the results obtained.

Soil Surveys and other Soil Investigations.—With the policy of steady expansion of irrigation facilities to lands which were mainly dependent on the vagaries of nature for their supply of water the problem of proper utilisation of such land for maximum crop production has become urgent and important. Crop soil surveys help to decide in advance, the suitability of the tract surveyed for a new crop or system of cultivation, which it is desired to introduce. This advance information is very essential as otherwise the owners and cultivators may be put to serious losses by an ill-informed land policy, and the land itself suffers serious and lasting damage. Formation of bogs and saline patches in areas subjected to careless over-irrigation is a familiar example of this kind of damage.

The details of procedure vary according to the purpose of the survey but all surveys include a study of the soil in the field, its crop and cultivation history, over at least a 5-7 year period previous to the survey, its environmental and climatologiacl relationships and its subsequent examination in the laboratory for its texture and composition, its capacity to absorb irrigation water and drain the excess, and its fertility status with reference to the prevailing cropping system.

By far the most important of such surveys conducted during the past 25 years is that by Dr. B. Narasimha Iyengar, of the Irwin Canal Tract, covering an area of 120,000 acres in extent, brought under irrigation by the Krishnaraja Sagara Reservoir Project. This survey was intended to formulate a suitable cropping scheme for the tract with special reference to the growing of sugarcane and paddy and such other commercial and grain crops. It may be justly claimed that the rapid extension of sugarcane cultivation in that area culminating in the establishing of the Mysore Sugar Factory at Mandya is in a large measure due to this survey and to the large-scale field trials at the Government Experimental Station at Gandhal. As time progressed, several other money crops have been introduced in this area

with conspicuous success, the most notable of these being tobacco and long and medium staple cotton.

In the light of the experience of the undoubted value of such a survey it has become a common practice to undertake a crop soil survey of all new lands before a final cropping programme is drawn up for the tract. Over ten crop planning surveys have been conducted in several parts of the State during the past few years.

Resurvey for Crop Planning and Land Reclamation.—Equally important with a primary survey of the type described above is that which concerns land lost to cultivation or made unfit by careless irrigation, injudicious crop rotations, or negligent cultivation, resulting in the formation of bogs and saline patches.

Of several surveys of this type, mention may be made of two major ones conducted in some villages of the French Rocks Taluk, and the Vani Vilasa Sagara Tract in the Chitaldrug District. It is a matter of no small satisfaction that the measures recommended for the lands in French Rocks have effectively reclaimed the land and their productive efficiency has gone up by over 100%.

The survey of over 10,000 acres of the Vani Vilasa Sagara Tract has just been completed and recommendations are being formulated.

Effective drainage of the land is one of the methods adopted for the reclamation of this type of land. Experiments in pot culture and in the field have shown that saline lands can be satisfactorily cured by successive and liberal applications of green manure, compost and farmyard manures supplemented wherever available by a dressing of press mud and molasses. Repeated applications of green manure alone have been found to 'sweeten' many of these lands and allow normal drainage of excess water.

Equally important with these, though of a routine nature, is the regular examination of over 100 soil samples a year from interested agriculturists for a useful programme of crop cultivation under their particular environmental and climatological conditions.

Quality of Agricultural Produce.—While the majority of agricultural produce such as the cereals, pulses and oilseeds can be placed on the market after a fairly simple process of cleaning, drying, husking and similar treatment, others have to be processed through slightly elaborate methods of concentration, curing or weathering before they are fit for the consumer. Jaggery and sugar from sugarcane, cured coffee and tobacco and shelled arecanuts are examples of this type.

The Section has paid considerable attention to each of these subjects and has been able to place before the cane-growers a very simple method of preparing jaggery, boora or crystal sugar according to the demands of the market or the taste of the consumer. Moreover, this can be done with but little addition to his normal jaggery boiling equipment or his technical labour corps. To further assist the ryot in this direction preparation of

a cheap decolorising material—activated carbon from agricultural waste—was undertaken and successfully executed. Moreover, this can replace the unnecessary and often harmful chemical decolorisers in the preparation of pale coloured sugar or jaggery by indigenous means.

The time and method of curing tobacco for colour and quality, the proper fermentation of coffee for appearance and liquor, the husking of areca for correct curing, are some of the other problems which have received and are still receiving continued attention.

Conservation of Wastes and Byproducts.—It is a truism to say that the limiting factors of agricultural production are manure and water, apart from the land itself. The ryot's most important and surely the most economical source of manure is the waste from his herd of livestock, land and household. If all such resources could be conserved, it is estimated that each acre of the total arable area in Mysore will get at least one ton of good manure a year, whereas now, quite a few million acres are starved for want of this rich source of humus and plant food.

It has been the aim of this Section to devise suitable means of conserving these vast resources of cheap manure, by which the ryot, without any elaborate equipment or additional cost, can enrich his land. Of several methods, mention may be made of the Fowler and Mysore methods of heap composting, and the Indore and Acharya methods of pit composting.

By these means the quality of the waste is improved three times at least, and availability of plant foods increased by over 50%. Its influence on the improvement of the physical structure of the soil also is considerable.

Composting of town refuse has been in practice in the Mysore City Municipality for the last fifteen years and now forms a part of the routine of the sanitary disposal of the city waste. An all Provinces organisation is in working for the past 18 months, to popularise these methods of composting refuse all over the State. 17 Municipalities have already taken to it and 18 others are due to adopt it during the next 6 months. At the same time arrangements are already afoot to popularise composting in rural Mysore beginning with the selected *hoblis* for a start.

Equally with the conservation of manures, economic utilisation of water is of importance. While the ryot is usually careful in this respect, in areas of restricted water supply, in tracts served by river channels there is a very common tendency to use more water than is necessary. This is altogether unprofitable, and often harmful as useful water is wasted, and the land is likely to become marshy and saline on account of excessive irrigation, and the crop consequently suffering in yield and quality; particularly with dry crops like ragi, cotton and tobacco an excess of water causes a luxurious vegetative growth, with a corresponding fall in the yield and quality of the grain or other produce desired. In co-operation with the irrigation department, critical studies on water requirements of crops in relation to soils, manuring and environmental conditions are in progress since 1943,

Chemical and Bio-chemical Aspects of Crop Production and Protection.—The Section, dealing as it does with all aspects of soils and crops, has always had the privilege of being the co-ordinating and co-operative centre of most activities of the Department. It assays the quality of crops produced by the Botanist (like juice quality of a new variety of sugarcane and oil content of a new variety of groundnut); it assists him in the zonalisation of varieties of a particular crop for use in different parts of the State and it also assists him in fixing seasonal and cultural operations for maximum crop production.

Again, investigations of fungoid diseases often involves the preparation and standardisation of spray mixtures, and the Section has devoted considerable attention in this direction, specially with crops like coffee and areca.

The problem of producing cheap and effective insecticides, has always been a pressing one and has become even more so under the stress of the present war. Imported chemicals like arsenicals are costly and very often poisonous. Investigations undertaken jointly with the Entomological Section have brought to light several indigenous plant substances which are not only useful as insecticides, but more important, totally harmless to cattle and men. A new insecticidal soap—Hongey Oil Resin Soap—has been prepared and placed on the market, and has successfully replaced the fish-oil soaps hitherto imported. A very useful insecticidal plant—*Derris elliptica*—the source of the famous 'rotenone', has been imported and its cultivation is being systematically extended.

Demonstration and Propaganda.—Ever since its formation, the Section has had the opportunity of testing, with a large measure of success, the results of field and laboratory investigations, on the cultivator's land and of popularising improved methods of farming and of processing agricultural produce, by demonstrations in fairs, exhibitions and rural centres. As a matter of routine work, over 100 fields and estates are inspected every year and advice tendered on specific problems, whenever such advice is needed or sought by a cultivator.

This period of 25 years started with the hope of a new and better world at the end of a great war and ends, tragically enough, in the midst of a greater war enveloping the whole world in its exhausting grip. Problems of food production and food preservation, supply of raw materials have all become urgent and important for both war and peace purposes. As never before, the place of the agriculturist as the first in the field, both for winning the war and in consolidating the peace, is unquestionably recognised. Surely, identified as the Union is with the progress of organised agriculture in Mysore, is it too much to ask of the members of the Union, to act as live centres of dissemination of the accumulated knowledge of the past 25 years and assist the Department to a greater degree, in facing these problems and solving them successfully?

B. T. NARAYANAN.

The Activities of the Entomology Section

The development of the activities of the Entomology Section during the period of the past twenty-five years has followed closely the lines planned out at the time of its inception. The primary work of the Section related to the investigation both in the Laboratory and in the field, into the biology and reaction to environment and the means of prevention and control of important insect pests of staple food and other crops. The actual application of preventive, remedial and control methods developed against the several pests, on a large scale, under natural and field conditions formed the logical and subsequent executive work undertaken in all cases by the Section. A large amount of propaganda and education by means of lectures and posters among the people in the villages always formed a vital and necessary preliminary portion of the executive work. Then came the actual practical demonstrations of the methods evolved, in the ryots' holdings conducted almost entirely by the staff of the Section.

Under this plan of development of the activities of the Section, have been included such injurious insects of economic importance, as (1) paddy stem-borer; (2) paddy case-worm; (3) sugarcane stem-borer; (4) hairy caterpillar of all mungar crops; (5) wingless grass-hopper of jola, ragi and groundnut; (6) coffee stem-borer; (7) coffee shot-hole borer; (8) tobacco stem-borer; (9) lab-lab pod-borer; (10) potato epilachna beetle; (11) citrus twig and stem-borer; (12) pulse beetles and other stored-grains' insects. Other pests of comparatively less importance, namely, surface beetles and grass-hoppers of dryland crops, Jasamine mite, beetle-vine, earthworm and sugarcane root-grub were also studied in detail and controlled. As a result of enlightenment derived from extended propaganda and demonstrations carried out by the staff of the Section, the ryots also gradually realised the advantages of collective and co-operative efforts in the control of particular pests like the hairy caterpillar, and wingless grass-hopper, the lab-lab pod-borer, the paddy case-worm and the potato epilachna beetle. The village *panchayats*, in most of the localities affected by these insects, also materially contributed to some extent, to the work of keeping the pests under control. A good deal more of the sense of the need for timely and proper control of insect pests of crops, has, however, yet to be developed by the cultivators in the villages. A constant endeavour is being made by the staff of the Section in inculcating this sense.

For the first time in the history of this Section, the aid of the Insect Pests and Diseases Act of 1917 of Mysore had to be sought, for the work of keeping a serious insect pest, namely, the Coffee Stem-Borer, under severe check in the coffee estates of the State. Due, largely, to the indifference on the part of a large number of owners of small coffee holdings in the matter of the systematic removal and destruction of borer-infested coffee bushes in

their estates, the incidence of the pest during the course of a few years attained such very alarming proportions that the very existence of hundreds of valuable estates came to be seriously threatened. Persuasive methods and any amount of propaganda utterly failed to bring about any beneficial change in the attitude of the indifferent planters; there was simply no alternative for the Government but to invoke the aid of the Act and declare the coffee areas of Kadur and Hassan districts as infected with the pest and sanction the enforcement of the provisions of the Act against the defaulting planters. This enforcement has now been in operation for the past seven years; a special staff and organisation have been constantly at work almost all the year rourd. The results of this new and rather rarely adopted course in the matter of control of an insect pest, have, indeed, been very encouraging and the incidence of the pest is steadily going down; but more remains to be done yet; the planters originally, careless and indifferent, have shown definite signs of a change of outlook and it is hoped that in the course of the next few years, conditions would so improve as to render the withdrawal of the enforcement of the provisions of the Pest Act, possible and advisable.

Intensive investigations of the biology and habits of serious insect pests affecting stored grains (stored for purposes of seed and consumption) formed one of the earliest and special items of work of the Section which finally led to the finding of very simple and efficient methods of storage and control. Extensive surveys of the indigenous methods of storage in rural areas all over the State were also made as a necessary preliminary study. No simpler and more efficient method of ridding infested grains of their insect populations as well as keeping them free from further infestation, has yet been evolved than the method of covering the top of the grains in a bin with a $1\frac{1}{2}''$ layer of fine sand, which was developed here very early. Extended studies of the effect of mercury in the form of pure metal as well as an amalgam on the eggs of storage insects, were also carried out and further studies are also now under way. The comparatively new line of control of insects affecting stored grains, *i.e.*, by intimate admixture of the grains with extremely finely powdered inert dusts, now being done here as well as elsewhere, has recently taken an interesting turn here, in that the fine dusts of certain materials of vegetable origin (as opposed to dusts of materials of chemical and mineral origin hitherto known) have shown promise as suitable for effective admixture with stored grains in order to combat insect trouble. It is hoped that the results of this work would also be of special interest to problems of storage in rural as well as urban areas. The recent constitution of the Foodgrains Storage and Preservation Committee (in connection with the work of the Food Department of the State) for which an experienced Assistant Entomologist of this Section has specially been appointed by Government as the Secretary, has made the work of investigation of the control of insects of stored grains all the more

urgent and important. This Committee has been grappling with varied problems of storage and insect control of a scale hitherto practically unknown in India, the unprecedented nature of which being, of course, due, to the emergency conditions now existing all over the country.

Of the beneficial and economically useful insects known and investigated, and developed for the benefit of the ryot, during this twenty-five year period, the egg-parasite of sugarcane shoot-borer; the cochineal insect of cactus and the honey-bee (bee-keeping) have been most important. The results of experiments and observations made here with reference to the egg-parasite of the cane shoot-borer for the first time in India finally led to the establishment of a parasite laboratory at Mandya for the mass production of the parasite, as a means to large-scale field liberations and thus the biological control of the destructive borer in the Sugar Factory Farms, the cane fields of the ryots in Mandya, Maddur and French Rocks taluks and in the Government Irwin Canal Farm near Mandya. The importation of the Cactus Cochineal Insect from Australia and Ceylon, also for the first time in India and its successful establishment in and around Bangalore at the commencement, later paved the way for the wholesale eradication of the noxious weed, which, in certain parts of the State, had even invaded dwelling houses besides covering up valuable land. Hundreds of acres of cultivable land were reclaimed all over the State since the introduction of this beneficial insect. Experiments made in the rearing of the honey-bee on modern lines, resulted in the standardisation of a bee-hive box of the particular size and design suitable for the State. The main aspect of the work in Bee-keeping, has all along been the introduction of the box-hive and better and profitable methods of bee-rearing into the rural parts of the Malnad where crude methods already existed for a very long time. Latterly this work was also taken up in suitable Maidan areas. The opening of thirteen Government Bee-keeping Demonstration Centres has already been done in this connection and the recent initiation of the Rural Development Drive all over the State has offered a valuable incentive for the furtherance of this very useful line of work.

It is well known that the use of chemical compounds in the form of fine dusts and spray solutions that is in widespread practice in all the Western countries for the control of insect pests, has but very limited scope in the villages in India because of the backwardness and poverty of the ryot. For this reason alone, most of the methods of field control of injurious insect pests in India have got to be simple mechanical and cultural methods. But these latter methods have obviously their own limitations and cannot be expected to cover the entire field of control of injurious insects. Operations such as dusting and spraying of affected crops of certain kinds often become inevitable under certain circumstances. A large number of non-poisonous and cheap and indigenous insecticides of vegetable origin, can be harnessed for the purpose in such cases. Although many of these

are possibly of far less potency as insecticides, than the standard Derris, Pyrethrum and Nicotine, sufficiently good use can be made of them in spraying and dusting operations by our ryots. The investigations carried out in this Section regarding the possibilities of the preparation of simple (non-arsenical) insecticides from a number of fish-poison and other plants and their products known to have insecticidal value, yielded very valuable data about the efficacy of several plants indigenous to the State. A practical off-shoot of this investigation was the production of a contact insecticidal soap—the Hongey Oil Soap—very useful for the control of soft-bodied sucking insects infesting a number of vegetable, garden and fruit crops. This soap finally displaced entirely the fish-oil soap originally imported from outside.

A large amount of matter embodying the results of the work of investigation (basic and applied), etc., carried out in the Section, has been and is being published in the form of Departmental Bulletins, Circulars, and Calendars, and in the form of detailed articles in several scientific journals in India and elsewhere. These publications deal with subjects concerning many aspects, namely bionomics, morphology, parasitology, taxonomy, physiology and ecology of entomological research.

It may not be out of place here if mention is made of the fact that the strength of the staff of the Section has not increased consistent with the rapid development of the activities, since the last twenty-five years. A good deal of time and energy of the staff is taken away by the work of propaganda and demonstration which, sometimes, extends over months at a stretch. The need for extra staff both for Laboratory investigation and executive work outside, has long been keenly felt and it will have to be met early.

B. KRISHNAMURTHY.

The Mycology Section

The work of this Section has been unique in the history of the department in Mysore, and of allied departments in India. It has to its credit an organization to combat the serious diseases of two important crops in the State like arecanut and coffee. The Mysore Government is taking great interest in the spread of preventive measures against plant diseases. Under a scheme organized by this Section, the Government is advancing to the Director of Agriculture every year a certain sum to enable him to purchase and stock sprayers and spraying materials in the interior of the affected areas in time for work just prior to the rainy season. The materials are sold on short credit to the garden-owners and planters during May–September for repayment after harvest free of interest. Fieldmen of the Section and special temporary fieldmen are engaged during the season to advise on the correct time and method of spraying and to render all help in the repair and maintenance of sprayers.

Twenty-five years ! Twenty-five years between two great world wars with all the concomitant high prices, scarcity of materials, difficulties of transport ! And yet the section has been able to maintain a continuity of the spraying work that speaks for itself. In spite of all difficulties, the spraying work has gone on increasing from year to year. The benefits to the planter and the garden-owner in the shape of increased returns more than outweigh the total expenditure on the whole department. If any justification were needed for expenditure on research it is to be found in the results of the work of this section.

The War has had not a little effect on the spraying organization. During the period of the first World War and immediately thereafter, it was extremely difficult to import the sprayers necessary for the work. During that period attempts were made to manufacture the sprayers in the Central Industrial Workshop and in the Premier Metal Factory, but they proved very costly. Similarly now when the second World War is on, sprayers are difficult to obtain. The cost of metals has gone up very high and some of them are unobtainable. We are however more fortunate in the attempts to manufacture sprayers locally. At first the Mysore Iron and Steel Works manufactured a few sprayers but could not meet the demand. A few private firms have manufactured sprayers that have done satisfactory work in the field. They have besides met all the demand for spare parts of the sprayers in use, in itself, a very heavy item, and but for which all the sprayers that had been sold in the earlier years would have remained idle at a time when they were most needed.

A new development in the organization of the spraying work that has been attempted during recent years is the transference of the stocking and sale of spraying materials and sprayers to the agency of Co-operative

Societies in the tract. Government have given generous concessions in their order of September 1931 to Societies undertaking this work. A few societies are doing this work and quite recently the Malnad Areca Marketing Co-operative Society, Ltd., with branches in Shimoga and Koppa has undertaken this work on a larger scale than the other societies. The need yet exists for the department to remain in the field, because the societies are not as wide-spread as one might expect, nor are they willing to come forward to undertake all the responsibilities of stocking and sale of the materials. There is a useful field for co-operation in this line, and the gap at the present moment is filled by a few enthusiastic private merchants who are making quite a decent job out of this work.

It may not be out of place to recapitulate a few facts in the life-history of the fungus causing areca koleroga (*Phytophthora arecæ*). It attacks besides arecanuts, a number of other plants. But there is more in it than meets the eye. For the proper fulfilment of its life-cycle it requires two host-plants, the strain on one being considered male, and that on the other female, a phenomenon called heterothallism. The areca strain, and the one on a flowering parasite, Loranthus or *bandarike* are male strains, and the ones on sandal and Jatropha, female strains. The large number of sandal trees around areca gardens probably afford an opportunity for fusion of the two strains to form resting spores (oospores) which help to carry the fungus over the hot summer season. The numerous other secondary hosts of the fungus also serve to keep the fungus alive, and account for the fact that it has not been possible to stamp the disease out of specified, even isolated, areas. These facts in the life-history point to an assumption, quite justified on analogous experience elsewhere, that the removal of the host plants other than areca palms from the immediate neighbourhood, might lead to the permanent disappearance of the disease from these gardens. Many of the rust fungi complete their life-cycle on two types of host plants. The fungus on each has quite different characteristics and hence the phenomenon is called heteroecism, as opposed to the heterothallism of the areca koleroga fungus. Instances of heterœcious fungi are to be found in the stem rust of wheat (now coming into prominence in the State) with its complementary host, the barberry (not found in Mysore, but only in the Himalayas) white pine blister rust, and apple rust. The last two are not present in India. Such fungi resemble the malarial parasite which can complete its life-cycle only by living in the mosquito and in the human being. One of the effective means of combating malaria is the destruction of the complementary host, mosquito. Likewise, wherever barberry is present, the eradication of the barberry reduces the rust on wheat. Similarly the white-pine blister rust is fought in the United States of America by destroying the complementary hosts, currants and gooseberries, and apple rust is controlled by eradicating all juniper or red cedar trees within approximately a mile of the apple orchard. A campaign for the

control of koleroga by the destruction of the secondary or supplementary hosts of the fungus is yet to be started, but the destruction of the sandal tree will entail a serious loss to the forest revenues of the State, and the destruction of other hosts like the jack tree will deprive the ryots of a very useful fruit plant.

A few of the other important items of work of the section may be mentioned. The successful attempts at controlling the black rot or koleroga of coffee (*Corticium koleroga*) led to the establishment of the Mysore Government Coffee Experiment Station at Balehonnur for developing the spraying work against black rot and leaf disease of coffee. The appointment of a Coffee Scientific Officer by the United Planters' Association of Southern India in 1928 for work on coffee diseases in association with this section inaugurated a period of intensive work on coffee problems. Many intricate questions in the study of leaf disease of coffee have been solved, and we are nearer the day when we can say that we are in a position to produce a variety of coffee that will resist the disease under known conditions.

The spike disease of sandalwood that is responsible for a great loss of revenue to the State was the subject of an intensive study. The discovery of intra-cellular bodies in the cells of spiked sandal and other leaves like those of Vinca, Stachytarpheta, and Dodonea, marks a distinct step forward as it links the disease with a number of virus diseases under study in Europe and America, where similar bodies have been discovered. It has further been found to be definitely communicable to other plants by artificial pin punctures as well as under natural conditions by haustorial connections with roots of diseased plants. This corroborates the theory of the infectious nature of such diseases and their similarity to such animal virus diseases as rabies, and fowl pox.

Effective control measures have been developed against other common diseases like root rot of apple, mildew of grapes, betelvine and peas, smut on jola, early blight of potatoes, etc. Recently diseases of paddy and ragi have assumed importance and steps are being taken to control the seed-borne diseases of these crops by seed disinfection methods.

S. V. VENKATARAYAN.

Brief Sketch of Work Done in the Botanical Section

During the last twenty-five years the main work of the Section has been to introduce better types of economic crops by breeding. The work has been much facilitated by the continuous co-operation extended by other scientific sections—Chemical, Entomological and Mycological—and the District officers with their staff. Acknowledgment is also due in a great measure to the members of the Mysore Agricultural and Experimental Union who shouldered the responsibility of trying many of the improved varieties in their lands and giving us their considered opinion.

This note will become a mere catalogue, if the research work undertaken on all the economic crops is detailed, but suffice it to point out that the policy laid out by Dr. Leslie C. Coleman augmented by Dr. V. K. Badami, accelerated by Mr. T. G. Rama Iyer and extended by Mr. M. J. Narasimhan, the present Director of Agriculture, has enabled this Section to carry out consistently and successfully many of the breeding problems undertaken.

Of the crops investigated and in which improved varieties are under cultivation and distribution are—Ragi, Paddy, Sugarcane, Cotton and Groundnut. Isolation of improved varieties in Jola, Castor, Pulses and Small Millets is under way. Maintenance of disease-resistant and high-yielding varieties in wheat, tobacco and potatoes are undertaken. Preliminary work in the cultivation of essential oil plants and insecticide—Pyrethrum—is also under investigation.

Amongst lesser millets H. 22 Ragi, a *Hain* selection and K. 1 Ragi, *Kar* type are occupying large areas in the State. In addition to these, the following new strains are recommended for general cultivation—R. 0009, R. 0862 early maturing, R. 0324 irrigated, R. 0870 and R. 0883 *Hain* varieties. It will not be out of place to record that closing down of the *Kar* Ragi Breeding Station has very much affected successful breeding work in Jola and Ragi suitable to *Kar* tracts.

It was possible to evolve high-yielding sugarcanes other than H.M. 320 owing to the munificent grants made by the Imperial Council of Agricultural Research for ten years. Of the varieties which are suitable for factory purposes and for *gur* making, the following, H.M. 661, H.M. 645, H.M. 647, I.C. 31 and I.C. 139 are noteworthy. The Section was the first in India to try the effect of irradiation by X-rays on sugarcane and cotton. Interesting and very useful results were obtained. Mutants produced by irradiation on Local Pattapatti have proved superior to the local cane in yield and sugar content.

Much work has also been done in the field of cotton owing to the generous grants given by the Indian Central Cotton Committee. Five new types, M.A. V, M.A. VI, M.A. VII, M.A. VIII and M.A. IX were evolved. Of these M.A. V and M.A. VI have proved most beneficial and outstanding.

M.A. IX is an improved cotton obtained by irradiation on Co. 2. Great impetus was given for cotton cultivation in the new Irwin Canal area. Despite the fact that at present the area under cotton in the newly irrigated tracts is not steady, yet the future for development of cotton cultivation in this region is very promising. Cotton was also introduced for cultivation in regions of Red loamy soils under rainfed conditions where cotton cultivation was unheard of. Of the varieties evolved by late Mr. V. N. Ranganatha Rao, M.A. II, a doddahatti cotton, replaced the local Gadag cotton in Banavar area. Of the Asiatic cottons Sel. 69, C.N. 86 and H. 190 occupy large areas in the black-cotton soils. Recent experiments have held out hopes of the introduction and establishment of the Egyptian and Sea Island cottons in the State.

Amongst oil-seeds, H.G. 1 Groundnut—a late maturing erect variety is occupying large areas in the State. With the financial aid of the Imperial Council of Agricultural Research, Groundnut Breeding Scheme is in progress. Of the other oil-seeds the preliminary work undertaken on castor has yielded useful results. The following varieties—L. 73, 74 and L. 216 are under trial in cultivators' plots.

Two more schemes subsidized jointly by the Imperial Council of Agricultural Research and the Government of Mysore on Breeding of Pulses and Breeding of Small Millets are under investigation. As already mentioned above, breeding work on Jola, Wheat and Potatoes are continued. The reecent work undertaken to grow Flax for linen purposes is yielding interesting results and at present attempts are being made to multiply the seeds of acclimatised varieties rapidly.

The work of the Section in recent years has greatly expanded and yet it is felt that very much more remains to be undertaken and investigated.

L. S. DORASAMI.

Fishery Development in Mysore

It is well known that fish is rich in nutritive value. It contains high percentage of protein, fat, mineral salts and vitamins. Fish, therefore, forms an important item of food of the people of all advanced countries of the world, where fishing industry is given a high place among the nation building activities. It is to provide this much needed nutritive food to our people, especially the rural population whose dietary is far from satisfactory, that our Government have recently taken steps to develop the fisheries of the State. 80% of the people of the State eat fish if it is made available.

As a preliminary step towards the development of fisheries a survey of all the fishery resources of the State was conducted. It is noticed that the fishery resources are vast. But owing to the absence of any effective management of the fisheries they have continually been subjected to severe destructive fishing. The regular catching of egg-laden fish and the young ones during breeding season and the fish migrating from one water source to another, by fishermen all over the State have brought about the depletion of the fisheries. With the impoverishment of the fisheries the fishermen have become poor and many of them have given up fishing and taken to other pursuits in life. To build up the fisheries in its present condition is no doubt an uphill task. By enforcing conservation measures such as establishment of conservancies where fishes breed, declaring close periods during spawning seasons, prohibiting destructive fishing and stocking the tanks and rivers with good species of food fishes, our fisheries can be made highly productive.

Measures are being taken to organise fishery development by effective conservation and stocking in the rivers and tanks of Shimoga, Mysore and Kolar districts of the State. The schemes in this connection also include steps to be undertaken regarding catching, transportation and marketing of fishes. Gradually the development work will be extended to other parts of the State.

With a view to popularise the idea of fishery development and to impart correct knowledge to the people on the measures to be adopted for the improvement of tank fisheries popular talks on pisciculture are being given in some of the rural parts of the State.

Two fish farms, with specially designed fish ponds, have been established, one at Markonahalli and another at Markandeya. Acclimatisation experiments on three species of non-indigenous food fishes—*Catla, Gourami* and *Etroplus*—are being carried in the farms besides studying the life-histories, habits and parasites of some of the local food fishes.

B. S. BHIMACHAR.

General Work Done in the Veterinary Department for the Last Twenty-five Years

The growth of the Veterinary Department in these twenty-five years has been on rapid strides. The activities of the Department were almost obscure in the year 1919 having only 16 Veterinary Institutions. As the public began to realise the benefits they would be having by seeking veterinary aid for the welfare of their cattle, there have been more and more offers of donations from generous public for construction of Veterinary Hospital buildings. At present there are 89 Veterinary Institutions in the State. It has been the ambition of the Department and the public at large to have a Veterinary Dispensary for every Hobli headquarter as in the case of human hospitals and educational institutions.

The activities of the Department were further developed by the amalgamation of the Live-Stock Section with the Veterinary Department in the year 1940.

Now there are nine District Veterinary Officers, one for each District, to look after the work connected with the Veterinary Section as also Live-Stock Development in each district.

The main activity of the Department has all along been to combat with the contagious cattle diseases in the State and for the eradication of which no pains have been spared by the veterinary staff. The Serum Institute and Research Section have played their role most magnificently in making the required biologicals at all times and suggesting ways and means for the eradication of cattle pests in the State.

A short note is also appended hereto as regards the activities of the Serum Institute and Research Section.

Under Live-Stock Improvement in the State, encouragement has been extended by Government for the starting of Cattle Breeding Farms through private agencies making pasture land and cattle available for people really interested in cattle breeding.

The introduction of cross-bred merino rams has improved the local breed of sheep for improving the wool yield. Report of the Sheep Expert in the matter of developments effected in the line is also enclosed.

The Department has also undertaken the distribution of Bulls, Bull Calves, Murrah Buffaloe Bulls, Pedigreed Poultry and fertile eggs under Rural Reconstruction Scheme to selected hoblies and village panchayats for improvement of cattle and poultry in the State and considerable progress has been achieved.

RESEARCH SECTION

1. The Research Section was inaugurated in the year 1928, just after the return of the two Veterinary Officers deputed for a prolonged training

at Mukteswar for three years in Veterinary, Bacteriology and Pathology, Serology and disease investigation. On the return of the Veterinary Officer deputed for training in Europe, a whole-time Research Officer was appointed in 1937 and a Biochemist in 1942.

The aim of the Section is to investigate into the causes of the several diseases of Live-tock in the State and undertake detailed laboratory work and suggest remedial measures.

2. Intensive studies were undertaken on the several problems in co-ordination with the Serum Institute and relevant research work was undertaken on the more serious diseases of cattle and sheep, namely Rinderpest, Hæmorrhagic scepticemia, Black quarter and Anthrax.

Besides, investigations into the following diseases of cattle were also undertaken: Johne's disease, tuberculosis, deficiency diseases, malnad gastro-enteritis, sterility, nasal granuloma, protozoan diseases such as piroplasmosis, trypanasomiasis and helminthiasis fluke diseases.

Systematic work was also undertaken on sheep diseases, principally verminous enteritis and fluke diseases. Sheep-pox and anthrax in certain notoriously infected localities as well as contagious pleuropneumonia among goats were investigated.

Preliminary work on artificial insemination was also undertaken. A special scheme for intensive control of fluke disease is operating in the canal areas.

Among horses, abortion among stud mares and biliary fever were taken up for detailed study and treatment recommended.

Among poultry, fowl-pox and diphtheratic roup, lekemia, bacilarry, white diarrhœa or pullorum disease, ranikhet disease, worm diseases and some of the deficiency diseases were intensively pursued under a scheme partly financed by the Imperial Council of Agricultural Research.

Among dogs, work in rabies was pursued more diligently and a potent vaccine was evolved which has since been commercialised.

The following vaccines were prepared and standardised:—

1. Anti-Rabic Vaccine.
2. Anthrax Saponin Vaccine.
3. Johnin.
4. Tuberculosis Vaccine.
5. Fowl-Pox Vaccine.
6. Roup Vaccine.
7. Poultry Worm Capsules.
8. Sheep-Pox Vaccine.
9. Sex Hormone

besides many autogenous vaccines.

The Section in addition has fully collaborated with the Veterinary Inspectors in diagnosing and controlling many of the deadly and deficiency diseases in the State. In fact, it has created a live interest in veterinary

personnel for the control of the live-stock diseases. The Section has also co-operated with the Palace, Forest and Agricultural Departments in the State as well as the Veterinary organizations in the neighbouring provinces.

A new set of buildings was specially constructed by Government in 1940 to accommodate the Section and a museum containing valuable pathological specimens was also organised.

3. The Section is in urgent need of a Biochemist and a Helminthologist and funds for fuller equipment of the new laboratories specially built for the purpose. It is suggested that 20% of the net profits of the Serum Institute be set apart annually as "Cattle Disease Fund" to ensure sufficient funds being made available for research work. The present staff may be strengthened with a Biochemist and Helminthologist with adequate field staff.

MYSORE SERUM INSTITUTE, HEBBAL

The Mysore Serum Institute was started in the year 1927 on a temporary and experimental basis with the primary object of preparing Anti-Rinderpest Serum and Rinderpest Virus which were then largely used by the Mysore Civil Veterinary Department for the Serum Simultaneous method of vaccination against Rinderpest. The Institute was placed on a permanent basis and shifted to the present spacious buildings, with effect from 1–4–1933.

As the Institute gradually expanded its activities year after year, preparation of several other Sera and Vaccines in addition to the above-mentioned biologicals, in sufficiently large quantities to meet the demand both from the State Veterinary Department as well as several places outside the State, were undertaken and the Institute has gained increasing popularity for these products during these years. The revenues realised and the net profits accruing therefrom have been ever on the increase.

The Institute has been, at present, manufacturing the following biologicals employed for the control of important epizootics amongst live-stock.

1. Rinderpest Bull Virus.
2. Rinderpest Goat Blood Virus.
3. Anti-Rinderpest Serum.
4. Blackquarter Bactrin.
5. Anti-Black Quarter Serum.
6. Anti-Anthrax Serum.
7. Hæmorrhagic Septicæmia Vaccine.
8. Anti-Hæmorrhagic Septicæmia Serum.
9. Fowl Cholera Vaccine.
10. Anti-Fowl Cholera Serum.
11. Sheep Pox Vaccine.
12. Fowl Pox Vaccine.
13. Poultry Worm Capsules.
14. Anti-Rabic Vaccine for animals.

A separate fully equipped Research Section is also attached to the Institute, where investigations on a number of problems relating to the diseases of live-stock are undertaken.

Suggestions for Further Development

(1) There exists a great need for the expansion of the Research Section. Valuable material is, for instance, available in the Institute for the conduct

of useful research of great practical value in Helminthology, Biochemistry, Pharmacology, etc.

(2) Construction of residential quarters for the staff is of utmost necessity as the Institute is located far away from the City.

SHEEP SECTION

The Sheep Breeding work in Mysore, though it dates back to a much earlier period, as could be traced from the records available, yet took a definite shape from the year 1920, when the Deparrtment of Agriculture took over the activities in this direction. The object was to distribute suitable stud Rams raised on Government Farms to breeders. Now and then consignments of Merino Rams and Ewes as also Corriedale Sheep (once) were imported from Australia and New South Wales, with the idea of getting cross-bred Merino Rams by mating them with the woolly strain of Mysore Ewes for being distributed to the interested breeders throughout the State and grading local flocks for wool improvement. With the exception of Malnad districts, climate and soil in Mysore are found to be quite congenial for sheep rearing. Mysore sheep can be conveniently grouped under two types—woolly and mutton, the former predominating.

Grading by cross-breeding was intensively carried out to secure a variety of graded rams and the work was concentrated in the Kolar District in view of the large number of sheep on the one hand and the suitability for sheep breeding in the locality on the other and a Sheep Breeders' Association was formed to carry on propaganda.

The main objects of the Sheep Breeders' Associations are: (1) formation of white flocks (woolly strain) headed by a suitable stud, preferably cross-bred, (2) shearing by improved machinery, (3) collection of wool for either co-operative marketing or utilisation in the Weaving Section, (4) providing veterinary aid and grazing facilities and (5) educating the sheep breeding public in better methods of sheep rearing, etc.

The activities of the Kolar Association grew in all directions as the sheep breeders began to realise the benefits of being members of the Association and this gave an initiative to other districts, resulting in the formation of similar associations, which are now six in number.

The first Sheep Breeding Station was started in the year 1921–22 at Yellachihally which is an ideal place for sheep rearing, and as the demand for suitable stud Rams from the sheep breeding public, especially members of the Sheep Breeders' Associations, increased from day to day, fresh Sheep Farms had to be started. Now we have five in number, namely (1) Hebbal, (2) Yellachihally, (3) Garudapalya, (4) Hunsur and (5) Dodballapur.

As the sheep breeders have come to realise the value of wool, which was ignored all these days, and the monetary returns due to further improvement by the known methods of better management and grading, there is an increasing demand for studs of all varieties throughout the State; means

should therefore be found out to meet their needs, as otherwise it will certainly lead to the unpopularity of the Section. With this end in view, six proposals have been sent for opening of fresh Sheep Farms in suitable localities, convenient for the sheep breeders, of which one has been already sanctioned and two are in the issuing stage. It is expected that the others would also be sanctioned. The proposals are:—

		Cost Rs.
1.	Padavalapatna Sheep Farm (Mandya District) ..	12,500
2.	Kuri Kaval Sheep Farm (Hassan District) ..	12,500
3.	Pillaganahally Sheep Farm (Bangalore District) ..	12,500
4.	Chicksandra Sheep Farm (Tumkur District) ..	12,500
5.	Babbur Sheep Farm (Chitaldrug District) ..	4,750
6.	Halaganahalli Subsidised Scheme (Kolar District) ..	8,500 over 4 years

N.B.—1st is sanctioned and 2 and 6 are about to be sanctioned.

In addition to the above Sheep Farms, it is desired to purchase regularly about 200 Bikanir Rams annually for being distributed in the woolly tract confined to a certain zone.

Proposals for starting a wool analysis laboratory attached to the Sheep Expert's Office would follow after the extra staff asked for is sanctioned.

T. V. MANICKARAJ.

Possibilities of Increasing Food Production in Mysore

During the last World War, the then officiating Dewan of Mysore Mr. A. R. Banerjee (now Sir Albion) in his address to the Legislative Council meeting on 15th March 1919, pointed out the food situation in the country and made it known that with existing stocks and the estimated harvest for 1918–19, the country would have enough food for only 7 or 8 months taking the average food requirement at 2 pallas of grain per head per annum. Again in his address to the Representative Assembly on 2nd October 1922, he reviewed the whole situation and pointed out that while the average annual production in the State was only 81·5 lacs of pallas, the actual requirements were 112 lacs of pallas as detailed below:—

Rice 22 lacs of pallas; Ragi 77 lacs of pallas; and Jola 13 lacs of pallas.

From actual figures published in the various season and crop reports he pointed out that while the actual area of land under occupation had increased by 3,00,000 acres between 1911–12 and 1920–21, the net cropped area had decreased from 60·47 lacs of acres to 59·54 lacs of acres while the area under current fallows had increased from 14·98 lacs of acres to 19·03 lacs of acres.

Coming to recent years, it is seen from season and crop reports that the average net area sown annually during the triennium 1939–40 and 1941–42 is about 65 lacs of acres in round figures and that the area under current fallows is about 14·5 lacs of acres. It is thus seen that during the last 20 years the net cropped area has increased from 59·5 lacs of acres to 65 lacs of acres while the area under current fallows has shown a decrease. Turning now to the production side, it works out to 95 lacs of pallas as against 81·5 lacs of pallas previously as mentioned in para 1. The 95 lacs of pallas mentioned above consist of 22 of rice, 58 of ragi, and 15 of jola in round figures.

The population of the State which was just over 73 lacs at the census of 1941, may now be taken at 75 lacs and the food requirements at 2 pallas per head per annum work out to 150 lacs of pallas. Of the total population, only 30 % may be taken as rice-eating and the rest as subsisting on ragi and jola. Thus we see that there are about 22·5 lacs of people with rice as their staple diet.

As mentioned previously, our production is only 95 lacs of pallas againt a requirement of 150 lacs of pallas. Our rice requirements alone for 22·5 lacs of people work out to 45 lacs of pallas while our average production during the period 1937–42 has been 22 lacs of pallas only. It is thus seen that our rice production is just one half of our requirement. According to trade statistics, our annual average import of rice is about 50,000 tons or 6 lacs of pallas. With our production of 22 lacs of pallas of rice annually, the quantity available is only 28 lacs of pallas or 1·25 pallas per head per

annum. So the requirement of 2 pallas per head per annum does not seem to correspond with consumption in normal times.

In the same way, taking the actual consumption of millets also at 1·25 pallas per head per annum 70% of the population who subsist on those grains require only 65·6 pallas. The average annual production of these grains during the same period has been 66 lacs of pallas. These figures with regard to consumption and production of ragi and jola seem to justify the common belief of our self-sufficiency with regard to millets in years of normal rainfall.

It is also a well recognised fact that only 30% of the population of India is adequately nourished in normal times. The estimate of the requirements at 2 pallas per head per annum may have been based on adequate nourishment. On that basis, our requirements work out to 45 lacs of pallas of rice, and 105 lacs of pallas of millets, When compared with these figures, our production of 22 lacs of pallas of rice and 66 pallas of millets falls very short of our requirements for adequate nourishment. It actually means that our production of rice has to be doubled and production of millets increased by about 60%. As the population itself does not remain stationary, the production also must go on increasing beyond the above-mentioned limits.

Even during and towards the close of the last World War efforts were made and inducements offered by Government to increase production. The position then was not so acute as it is now and the measures then taken seem quite insignificant when compared to what is being undertaken now.

Dr. Leslie C. Coleman in his notes dated 7th August 1917 and 8th February 1922 on Agricultural Production in Mysore gives the following figures as the average annual production to which are now added those for 1937–42.

Period	Outturn in pallas		
	Paddy	Ragi	Jola
1905—15 ..	41,78,639	55,92,034	11,78,295
1915—20 ..	37,66,534	52,60,656	10,40,058
1937—42 ..	44,22,535	52,73,125	13,42,276

The figures given by Dr. Coleman have been discussed in my note on " Agricultural Production in Mysore and How to Increase it" published in Nos. 2 and 3, Vol. 6 of *The Journal of the Mysore Agricultural and Experimental Union* in 1924. Judging from the above-mentioned standard of 2 pallas of grain per head per annum, the then position was that production of ragi had to be increased by over 20 lacs of pallas or by 40% while the position with regard to rice demanded an increase of only 10%. As mentioned before, the production of millets now demands an increase by about 60% while the production of paddy has to be doubled.

The average yield *in pallas per acre* of the three principal crops during the periods mentioned above is given below:—

Periods	Paddy	Ragi	Jola
1905—15 ..	5·7	2·5	1·9
1915—20 ..	5·0	2·5	1·6
1937—42 ..	6·0	2·4	2·0

It is seen from the above figures that while the average yield of ragi has remained almost constant at 2·5 pallas per acre, the yields of paddy and jola show a slight improvement. The biggest improvement of an increase of one palla per acre between 1920 and 1942 is shown by paddy. As during these years, the variety of local seed sown in channel irrigated areas has been largely replaced by G.E.B. 24 and other improved varieties and strains evolved by the Department of Agriculture in addition to popularisation of artificial manures, the improvement may be due to the combined effect of both.

That the average yields per acre are rather low, will, I think, be admitted by the majority of us. The standard yields fixed by Government for various districts vary between 6 and 9 pallas per acre for paddy, 2 and 5 pallas for ragi, and 2 and 5 pallas for jola. It is only in very exceptional seasons that a full 16 anna crop is recorded for the whole State. During the period 1937–42, the actual outturn of paddy has varied between 11 and 15 annas, that of ragi between 7 and 12 annas, and that of jola between 8 and 12 annas. It is thus seen that the paddy crop has always been much nearer the standard outturn than the other two. In the year 1937–38 the paddy crop was a 15-anna one and worked out to 7·5 pallas per acre nearly. In the same season, ragi was only a 11-anna crop with an yield of nearly 2·5 pallas per acre, and jola was an 8-anna crop with an yield of 1·75 pallas per acre.

Though the average yield per acre is rather low for all the three crops, we all know that there are stretches of land which produce 3 to 4 times the average yield. For the average yield to be brought down to such a low level as given above, there must be a very large area of land producing a crop much below the averages given.

If Mysore is to be made self-sufficient with regard to production of the three chief food grains, the problem of increasing production has to be tackled seriously. The energetic drive that is now being made to increase production should not be slackened with the close of the present war but ought to be intensified to a greater extent than at present. The note published by me in 1924, was only meant to stimulate thought in that direction and did not put forward any cut and dry scheme before the public or for consideration by Government. It is the intention of this note to put forward certain proposals to achieve the required object.

How is it then possible to increase production?

There are two ways of doing this: one is to increase the extent of land under cultivation; and the other is to increase the yield of lands already under cultivation.

It is not an easy task to bring new land under cultivation, for it requires capital, labour, implements, live-stock, seed and manure. In well populated tracts, there is very little new land that can be given for cultivation. Where extensive areas of such land are available for cultivation, *e.g.*, in the malnad, there are not enough people to take up such land and bring it under cultivation. In the present food production drive or "Grow More Food Campaign", new areas have been granted for cultivation on favourable terms and it would be interesting to find out how much such new land has been brought under cultivation without allowing a corresponding area of old occupied land to lie fallow. It may also be worth while to find out how much of the *Amritmahal kavals* surrendered to the Revenue Department in previous years have been taken up by people and brought under the plough.

I may mention in this connection a peculiar notion which seems to prevail in some quarters. A certain officer recently said that all the best lands of a locality are reserved as *Amritmahal kavals* while the next best areas are kept as village gomals finally leaving only the worst areas to be cultivated by ryots. Such an idea is far from truth. I can say that all the best lands have been taken up by ryots and that what they have not taken up till now in well populated tracts is not worth having.

That it is not an easy task to bring new land under cultivation is borne out by the fact that considerable areas of occupied land lie annually under current fallows. According to season and crop report of 1941-42, the area under current fallows is nearly 15 lacs of acres while the net area sown is nearly 66 lacs of acres. If all the area under current fallows which amounts to nearly $\frac{1}{4}$ of the net area sown can also be made to produce food grains, there will be an appreciable increase in production though the yield may be between 2 and 5 pallas of grain per acre according to the nature of cultivation—dry or wet.

So far as my knowledge and experience go, the areas under current fallows are not left as such as part of a regular rotation of crops. They are not cultivated on account of the inability of the ryot to do so in time. A small proportion of it belonging to absentee landlords might have been left as such because the cultivating tenant wanted to have some grazing area for his own cattle during the period that the crop on his own fields is growing.

In view of the fact that an area nearly equal to $\frac{1}{4}$ of the area sown is annually left to lie fallow, it is a point for consideration whether any new land should be granted for cultivation at all. To provide for the natural increase in population and to preserve land from erosion when granted in

isolated patches in the midst of a large area of waste land, it seems desirable not to grant any new land at all except in localities where land is not allowed to lie fallow.

The main difficulty in bringing such lands under cultivation seems to lie in the insufficient resources of the ryot to plough up the land while it is in a fit condition for that work. How far cultivation by tractors can solve his difficulty seems worth while investigating. Since the ryot by himself cannot own such an equipment the amount of help that can be given by Government is well worth consideration.

Even the agency set up by the Government of India for the "Grow More Food Campaign" came to the conclusion that there was a better chance of achieving their object by concentrating their attention on producing more per acre from lands under cultivation than by extending the area. So we now come to the problem of increasing the yield per acre.

It is a common practice to compare productivity of land in various parts of the world by considering the yield of wheat per acre. In my note of 1924, the following figures are given: England, 8·8 cwts. per acre; Germany, 8 ; France, 5·4; Austria, 5; India, 2·8.

These figures show that England still keeps the lead with regard to quality of her agriculture. The fertility of English soils is due to centuries of continuous manuring as pointed out by Calvert in his book *Wealth and Welfare in the Punjab.* The low productivity of Indian soils is due to decades if not centuries of inadequate manuring. There is a proverb in Kannada—*heddana aramba gobbaradalli* (ಹೆಡ್ಡನ ಆರಂಬ ಗೊಬ್ಬರದಲ್ಲಿ)—which means a duffer also can succeed in agriculture if he has ample manure at his disposal.

In his recent note on Technical Possibilities of Agricultural Development in India, Dr. Burns has stated that " Indian soils are at a stage in which on the whole there is neither increased nor diminished production, and judging from the results of over 5,000 experiments in India, it is probable in most parts that the soil has become stabilised at a comparatively low level of production." A somewhat similar statement with regard to Mysore soils was made in my note in 1924.

Further he also says " there are, however, indications that improved varieties with a higher uptake of nutrients may depress this level further. This being so, it is not difficult to ensure increased yield by manuring and specially by manuring with nitrogen, for which the land has the greatest hunger." Both Dr. Coleman and myself have held a similar opinion and I have always opposed introduction of improved varieties of seed without adequate manuring at the same time.

Increased yields per acre from lands already under cultivation can be brought about by the use of improved varieties of seed, by adequate manuring, and by better methods of cultivation. Of the increase that can thus be brought about, it has been estimated in Europe and America that at least

50% should be attributed to use of manures, about 30% to the use of improved seed and the rest to better methods of cultivation. For example if we succeed in getting an increase of 4 pallas of paddy per acre over the present average yeild of 6 pallas per acre, an increase of 2 pallas per acre at least will be due to adequate manuring, 1 palla to the use of improved variety of seed, and the rest to better methods of cultivation. Writing about paddy in the note above referred to Dr. Burns says that there should be no difficulty in increasing the present average yield by 50%, *viz.*, 10% by variety, and 40% by manuring. The importance of adequate manuring is thus made clear and justifies the Kannada proverb quoted on a previous page.

Owing to increase of population and extension of cultivation during decades if not centuries, it is not now possible to provide sufficient cattle manure to get the maximum yield from our soils. Moreover, farmyard manure being a general manure in which all plant foods are contained in certain proportions, it is not possible to cater to the needs of individual crops and types of land by using that alone and no other manure. Further, the general trend of opinion now-a-days is to value farmyard manure not so much for its fertilising ingredients as for its mechanical and biological effects upon land. The same thing holds good for compost manure also for the production of which on a large scale, a very vigorous drive is being made.

That farmyard manure is the basis of all rational agriculture is recognised all the world over. After 25 years of work, the Imperial Agricultural Research Institute of India also came to the same conclusion as mentioned in one of its reports. The high yields from lands in Europe are due to the continued use of artificials with farmyard manure, and if we want to produce more per acre than at present we have also to go the same way. When they came into general use in England, that country was even accused of sacrilege for ransacking all the continental battle-fields for collection of bones to manufacture superphosphate or use it as such in a crushed condition.

Dr. Burns in his note quoted previously lays special emphasis on manuring with nitrogen. I go a step further and plead for a balanced manuring with nitrogen as well as phosphoric acid, not only to increase production but also to build up soil fertility. There is a saying in Germany to the effect—saturate the soil with phosphoric acid, manure with potash according to the nature and requirements of the crop, and regulate the yield by manuring with nitrogen. On the advice of the late Dr. Paul Wagner of Darmstadt, lands in Germany had been heavily manured with phosphates for decades before the last war, and still there was an appreciable decrease in yield during the last war for want of phosphates. Even attempts to liberate soil phosphate by heavy potash manuring, of which Germany had the monopoly, was not a success. I make this statement from personal knowledge and experience in Germany during the last war.

To get an increased outturn per acre from our lands by adequate manuring, it is necessary to supplement the available farmyard manure and

the compost that may be produced hereafter by other manures which are industrial bye-products or manufactured specially for use in agriculture. Experiments conducted by the Agricultural Department over a long period of years have shown that groundnut and castor cakes, sulphate of ammonia, superphosphate, bone-meal and potash salts either singly or in suitable combinations are the manures which can be used profitably for paddy and ragi. Dr. Burns advocates an application of at least 20 lbs. of nitrogen per acre but as such a dose was not found profitable under Mysore conditions for paddy, the usual dose does not exceed 12 lbs. of nitrogen per acre.

A large-scale trial for paddy on 27 acres of private land, a few miles away from Hosa-Agrahara railway station on the Mysore-Arsikere line for the last 20 years is a very good example of what can be achieved in channel tracts where there is a scarcity of either farmyard or green manure. The land in question belongs to *Rao Bahadur* B. K. Garudachar of Bangalore and is being cultivated on the *varam* or share system by more than a dozen tenants. Under local methods of manuring, the area was producing about 300 seers of paddy per acre. When my advice was sought in 1924, I suggested a mixture of oil-cakes and superphosphate in certain proportions to provide about 12 lbs. of nitrogen and 18 lbs. of phosphoric acid per acre, and the mixture is even now being applied at the rate of 320 lbs. per acre. Depending on the price of materials, the cost per acre has varied between Rs. 25 and 15, but has again risen during the present war. Since it has also become difficult to get superphosphate at reasonable prices in recent years, bone-meal and calcined tricalcic phosphate are being used instead. Since crop accounts of the middle period of 10 years have been lost or mislaid, only figures pertaining to the first and last 5 years are given.

Season	Yield of paddy in seers per acre		
	Maximum	Minimum	Average for the area
1924—25 ..	1085	460	878
1925—26 ..	1173	476	924
1926—27 ..	1187	636	964
1927—28 ..	1620	1056	1267
1928—29 ..	1710	1090	1370
1939—40 ..	2081	1348	1639
1940—41 ..	1950	1264	1542
1941—42 ..	2265	1410	1706
1942—43 ..	2296	1444	1749
1943—44 ..	2296	1485	1770

A glance at the above table shows that the yield has been steadily rising and shows a tendency to have settled down only during the last 3 years. As already mentioned, the average yield before manuring with artificials was started was only 300 seers of paddy per acre, and it trebled itself in the first year of manuring. During the 20 years of continuous manuring, the average yield has again doubled itself, rising from 878 to 1,770 seers per

acre. Another noticeable feature is that the gap between maximum and minimum yield has been steadily decreasing in successive years. Where the maximum was more than twice the minimum in the first year, it has shown an increase of only 50% over the minimum in the 20th year of manuring. Even the existing difference may be due to soil variation and difference in attention paid to cultivation by individual tenants.

The standard yield of paddy for the locality in which the lands are situated (Krishnarajpet Taluk, Mandya District) is only 1,200 seers per acre. From figures given above, it is seen that even the minimum yield is above the standard yield while the average yield exceeds it by about 50%.

The maximum obtainable yield of paddy under very good conditions in Mysore may be put down at 3,000 seers or 5,400 lbs. per acre and it remains to be seen whether that yield can be obtained by the present system of manuring alone in course of time. The work incidentally shows the way in which soil fertility can be built up through a judicious system of artificial manuring, using only a small quantity of cattle manure and that too not exceeding 3 or 4 cartloads per acre.

Coming now to various periods during the 20 years, the 4th year, *i.e.*, the season of 1927-28, shows a considerable increase over the crop of 1926–27. The average for the whole area has risen from 964 to 1,267 seers per acre, *i.e.*, by 300 seers or 540 lbs. per acre. As during this season, the variety of seed used was changed from local *kaddi sanna* to the variety G.E.B. 24 of Coimbatore, part at least of the increase has to be attributed to the new variety of seed used. At the end of the next period, *i.e.*, between 1928–29 and 1939–40 there has been an increase of nearly 270 seers in the average yield per acre. This can only be attributed to the building up of fertility in soil due to continuous manuring. In the next period of 5 years, *i.e.*, between 1939–40 and 1943–44, the average yield per acre has risen by 130 seers. This is just one-half of the increase during the last 10-year period, and works out to about 27 seers per acre per year.

The whole work is a good example of what can be done by an intelligent enterprising landlord to benefit himself and his tenants and incidentally increase agricultural production in the country.

The large-scale trial just described gives some data to forecast a general crop increase that can be expected. The paddy areas of the State can be divided into (1) channel irrigated tracts mostly in the districts of Mysore and Mandya; (2) tank irrigated lands for a monsoon crop, (3) summer paddy tracts mostly in the districts of Kolar and Tumkur, and (4) malnad areas which are dependent on rainfall only and not upon any stored water supply.

Since an assured supply of water is absolutely necessary for a successful paddy crop, it seems desirable to concentrate our efforts in the channel tracts. According to season and crop report of 1941–42, the total area under paddy in the districts of Mysore and Mandya was about 1,60,000 acres and the

average yield of paddy was 800 seers per acre, against an average of 580 seers for the whole State. As mentioned on a previous page the average for the whole State has risen from 5 to 6 pallas per acre between 1915–20 and 1937–42, *i.e.*, during a period of 22 years. In the large-scale trial conducted, the first year's average yield was about the average for the two channel districts and it increased by 55% during the first 5 years and doubled itself during a period of 20 years. After it reached an average of 1,370 seers per acre in 1928–29 the rate of increase has been roughly 30 seers per acre per year. As the total increase is the combined effect of new variety of seed and application of artificial manures, if the channel irrigated area of 1,60,000 acres in the districts of Mysore, Mandya and Hassan is treated similarly we may expect an average increase of 500 seers of paddy per acre at the end of the first 5 years and a further similar increase at the end of the next 15 years. It is thus seen that any policy to be laid down must be a long-range one extending over at least 20 years but preferably over 30 years—this being the interval between two Revenue Survey Settlements in our State.

Dr. Burns has estimated the average outturn of paddy per acre during recent years in India at 1,109 lbs., which works out to 600 seers and this is the average yield for Mysore during the period 1937–42. He also says that India should aim at a production of 1,000 lbs. of rice per acre which works out to 500 seers of rice or 1,000 seers of paddy. The yield from our channel areas has always been higher than the average for the whole State and it was 800 seers per acre during 1941-42. Dr. B. V. Nath, the present Director of Agriculture, Madras, has stated in a recent lecture of his (*vide The Hindu*, dated 16th October 1944) that the average yield of paddy in the Tanjore area has not gone beyond 1,200 lbs. per acre, *i.e.*, 700 seers while for the Godavery delta it is said to be between 1,600 and 1,800 lbs., *i.e.*, 900 and 1,000 seers per acre. It is thus seen that our channel tract yield comes midway between the two. As in Madras there are in our State also small areas producing as much as 3,000 seers or 5,400 lbs. of paddy per acre.

If a vigorous drive for manuring and introduction of superior varieties of seed is put through during the next 5 years, it looks quite possible to raise the average yield by 500 seers per acre, *i.e.*, to 1,300 seers while the present standard yield for the channel area is fixed at 1,200 seers per acre. If we succeed in getting this increased yield over an area of 1,50,000 acres in the channel tracts, we shall have increased the present average output by 7·5 lacs of pallas of paddy or by nearly 4 lacs of pallas of rice. We have still to make up 2 lacs of pallas of rice or 4 lacs of pallas of paddy, by raising the yield of tank irrigated areas. The total area now under paddy in Mysore is over 7·5 lacs of acres and if the same vigorous campaign is followed in selected tank irrigated areas also over an extent of 2 lacs of acres, it should not be difficult to get an increased yield of 2 pallas per acre

during the same period of 5 years. Thus it is quite possible to make up the deficit of 50,000 tons of rice.

The total area to be tackled will be nearly 4 lacs of acres and this is to be selected from the areas now under paddy. The expected yield will vary between 11 and 17 pallas per acre. The best response to manuring will be from areas producing a crop between 6 and 12 pallas per acre at present. The only way to select such areas will be by looking into village records of crop forecasts, whatever may be the opinion about the accuracy of such forecasts furnished by village officials. The results from thousands of demonstration plots and subvention farms laid out in recent years by the Agricultural Department may also be of immense help in selecting such areas.

The cost of manures for the area to be tackled may be taken at a modest figure of Rs. 20 per acre under present conditions. The total seasonal outlay amounts to 80 lacs of rupees. The quantity of all kinds of fertilisers needed may come to 50,000 or 60,000 tons. Besides, adequate arrangements will have to be made for a supply of the necessary improved varieties of seed. As these are matters which can be best dealt with by those who may have to shoulder the responsibility for increasing production, I refrain from making any suggestions as to how the money is to be found and the staff needed to put the work through. I can only say that the staff and resources of the Agricultural Department need to be considerably strengthened. As it may take 3 to 5 years to bring the scheme into full operation, we may expect to make up the deficit of 50,000 tons of rice in 8 to 10 years. If prices of commodities go down some time after the close of the war, the whole policy of increasing production may take a different turn altogether.

I have advocated a balanced manuring of nitrogen as well as phosphoric acid. Phosphatic manuring is one of the most complicated problems of Agricultural Chemistry and had not been satisfactorily solved in Germany before the present war started. As I have no data to believe that our soils do not need phosphates, I advocate balanced manuring to be on the safe side. The effects of phosphoric acid are best seen in the good start and uniform stand of crop, simultaneous ripening of crop in a field, proper proportion of grain to straw and the quality of crop.

As our deficit in ragi and jola is not serious with a consumption of 1·25 pallas per head per annum, I do not propose to deal with those crops.

B. NARASIMHA IYENGAR.

Agricultural Extension

Twenty-five years of long and continued service in the history of an organisation or institution is a distinct landmark, of which it may well be proud. Inspired by a selfless devotion to duty and prompted by a zeal to help the cause of the Mysore ryot, Dr. I. C. Coleman hit upon the idea of forming the Agricultural and Experimental Union as a link between the Department of Agriculture and the agriculturists, and thus hoped to bridge this gulf and give an impetus to the amplification of agricultural extension in the State. He has said in one of his speeches that "one of the chief functions of this Union should, I think, be to amplify and extend the experimental work done by the Department." He was one of the earliest and foremost agricultural scientists in India to think that the knowledge and results obtained on the Experimental Farms and in the Laboratories should reach the fields of the ordinary ryots for whose benefit these were intended. With this idea, he built up an up-to-date Department of Agriculture with Experimental Farms and Laboratories and also staffed them though inadequately to the task that it had to face. A necessary complement was the birth of the Agricultural and Experimental Union 25 years ago. We are told that several district, taluk and even village agricultural associations had existed long before the advent of the Union but, before the birth of this, almost all such associations had either disappeared, languished or were moribund. Having enquired into the causes for such failure, the founder of this Union gave a new orientation to the activity and policy of the Agricultural and Experimental Union. A sustained interest and burning enthusiasm was quite essential to the success and utility of this organisation and therefore it was quite clear that only those that had a stake in Agricultural interest and who were desirous of helping themselves and were prepared to sacrifice something for the common good, that is to say, keen agriculturists, willing to undertake experiments on their own lands were admitted to the folds of this fraternity.

For a considerable time, the membership of the Union wavered between 200 and 300, and but for the munificence of Government, the publication of *The Mysore Agricultural Journal*, an organ of the Union, would have long ceased to exist. Owing to the meagre resources of the Union, only limited funds were allotted for experimental undertaking by the members. Each member desiring to experiment was given about Rs. 8 worth of seeds and Rs. 10 to Rs. 15 worth of manures, implements for trial, etc. The results obtained by the co-operating members were placed before the general body meeting and discussed and published in the Journal.

A further change for the better in the method of agricultural extension took place about the year 1938. Agricultural extension implies adequate

staff of the right kind and resources for carrying on propaganda. For the 9 Districts of the State, the Department had up to 1938 only four District Officers. In the re-organisation, each district was provided with an Assistant Director. This was so far so good. The Assistant Director is the counterpart of the American or English county agent. While in America and England much of the agricultural and extension work is done on a voluntary basis by the farmer with the help and guidance of the county agents, our organisation of agricultural extension widely differs. The farmers in those countries form unions, clubs, breeding societies, etc., and through those the county agent works and guides them. But we here have gone a step further. The Union itself is not sufficient for the time being to reach the vast army of our ryots. We need assistant agents or the Agricultural Inspectors for a wide propaganda. The dream of Dr. L. C. Coleman in this respect is yet to be fulfilled. His aim was to post an Agricultural Inspector to each Taluk Headquarters with one Fieldman to each Hobli. Although the number of these officers have increased since the time of Dr. Coleman the desired goal is not yet reached.

Mysore is mainly an agricultural country and more than 80% of our population live on agriculture. The standard of agriculture and living are still very low. Education has not yet made headway and the majority of ryots being unable to read or write, have to be told and convinced by word of mouth. Published literature is mere waste from this point of view. In advanced countries like America, the Department of Agriculture spends considerable amount of money for publishing progaganda literature; from highly scientific bulletins down to the very ordinary topics such as menus for making tasty dishes from soya beans or mending men's suits (Miscellaneous Publication No. 482, United States Department of Agriculture). In Mysore we have to depend for propaganda on personal contact and exhortation, etc. Therefore, in our Agricultural Extension methods and for disseminating all the vast resources of truth which others have developed, we need an army of intelligent workers such as Agricultural Inspectors and Fieldmen. It is only when we have such men in increasing numbers, can we hope to enliven our agricultural methods and increase the ryots' standard of living. Since 1938 the scope for increasing the experimental activity of the Department was further promoted by the appointment of additional staff and also by extra grants. A new scheme of Demonstration plots, Subvention plots, Central Seed and "A" Farms was formulated and Government sanction obtained. This was the turning point in our Agricultural Extension Scheme and a live contribution for strengthening the enthusiasm and activity of the Agricultural and Experimental Union.

The present war brought an additional burden on the Departmental staff. The Department had to shoulder the responsibility of catering to the requirements of ryots, in such articles as cart tyres, wooden materials for carts, crow-bars, mumties (shovels), etc., in addition to its ordinary

routine of distribution of good seeds, manures and ploughs. In other advanced countries cited above the primary concern of the Department of Agriculture and the county agents is the spreading of scientific knowledge and propaganda. Service is left to the dealers and authorised persons and recognised firms, but in our case we are expected not only to fulfil the above fundamental objects but also act as salesmen. Under the stress of war conditions our Inspectors have become mere salesmen and it is hoped that when normal conditions are restored we shall revert to devote more attention for propaganda.

Another important consideration is the type of Agricultural Officer that we should have. The quality and equipment of this officer class is very vital to the fulfilment of the objects for which he is enlisted. He is one of the liaison officers between the Department and members of the Agricultural and Experimental Union and the success of this organisation, to my mind, largely depends upon the quality and heart of this officer.

The Hebbal Agricultural School was started as early as 1913 with the object of training sons of agriculturists. It was the cherished hope of those responsible to inaugurate this institution that the alumni would go out from the School fully equipped with sound knowledge and practice of scientific agriculture and thus not only help the parents and themselves but also prove as model agriculturists for others to follow in their lead. With this view and to attain the object the course of training was designed to be of a simple and practical nature with a low initial qualification. This was necessary to attract more young men in the early stages. How far this aim has been fulfilled, I do not propose to enter into its elucidation.

However, as the Department itself was expanding and was in need of trained men for Agricultural Extension Work, the passed candidates were gradually being drafted into Government and private service. Now the institution is serving to educate boys to seek a living through employment. But what of the quality of their mental equipment and knowledge of practical agriculture? Are these men imbued with devotion to duty, a spirit of service and the enthusiasm of a missionary to light the dark alleys for others to tread safely? Do our Agricultural Inspectors contact our members of the Union or the ordinary ryots freely and frequently in such a spirit of service? And what are the prospects for the man selected for such a service? Let the following passage answer these questions.

"We think it depends chiefly upon the man selected. There are some men who can command confidence, respect and obedience. It is a tremendous undertaking, this idea of a demonstrator going into a county perhaps strange to him, to study its soils, crops, animals, men, women, children, to have vision and faith to plan out better ways, not merely, temporarily better ways, but permanently better ones. It needs a man with a lot of agricultural science, a thorough grounding in agricultural practice, an economist, a preacher, an exhorter, a man of patience, faith, hope, and

kindling enthusiasm. When you see such a man as that going down the road, whether in automobile or on foot, stop him, pull him in, let the wife and children meet him. Are there such men ? . . . . We have seen men undertaking this office of county demonstrator who had not deep convictions regarding correct agricultural practice, nor the abiding faith and the enthusiasm needed to impart desire for good practice in others. It is worse than a waste of money to employ such a man; it is putting good farming into disrepute; makes the man in the rut laugh and remain contendedly in the rut." (Quoted from the *Farm Bureau Movement* by O. M. Kile.)

Judged from the above standard we are nowhere a match to the man of the right type. This does not mean that we are utterly devoid of talent and the kind of man most suitable for our purpose. The present Hebbal student, however, does not seem to serve the needs of the time, and the exacting functions the county agent is expected to discharge in the Post-War period. It is, I think, rightly the function of a University to train suitable candidates at least hereafter. We want men trained in the theoretical and practical agriculture of a very high standard so that they can speak with authority and face with confidence practical agriculturists such as our Union members. When such a firm knowledge and conviction is lacking in our personnel, it is no wonder he keeps away from meeting practical agriculturists. To the same extent we are not in a position to obviate criticism on this score.

In this connection it is interesting to quote what Sir P. Pheroze M. Kharegat, C.I,E., I.C.S, formerly Vice-Chairman, Imperial Council of Agricultural Research, has said in the matter of agricultural extension.

" County extension agent (of America) . . . . He is a fully qualified man who starts on a salary of 2,000 dollars a year. His business is two-fold—to convey the problems of the farmer to the College and to convey the results of the researches at the College to the farmer. Full and detailed instructions are given to the county agent as regards the special practices he is to explain and demonstrate but a great deal is left to his discretion.

The system is very similar to ours except that we expect our Agricultural Assistants or Demonstrators to do the same work without the necessary training, on one-tenth of the salary and for 10 times the numbers of farmers. Instead of having a man wno is fully trained on a salary of Rs. 200 for dealing with a Kanugos Circle (which may well be called a county) we have a half-trained man on a pay of Rs. 50 for a whole tehsil. Is it any wonder that our demonstration staff does not command respect or confidence ?" What Sir Pheroze Kharegat has said applies with equal force to Mysore also. We can mobilise competent men of the right type for our agricultural service provided we make it sufficiently attractive for them. All will agree that no body can work

wholeheartedly merely for the love of work with an empty stomach or on half rations.

The new scheme of 'Demonstration' the Department started, has stimulated an awakening in the minds of agriculturists and the high prices obtainable for agricultural products has prompted them to seek more and more help and advice from the Departmental Officers. Therefore it is necessary for us to employ more men to carry on our 'Demonstration' scheme to a successful end. Last year the Department has sold seeds and manures worth Rs. 6 lakhs and implements worth Rs. 7·34 lakhs. As regards Demonstration we had 2,291 Demonstration plots, 15 Subvention farms, 855 "A" farms and 22 Seed farms. Government contribute yearly a sum of Rs. 13,000 for this purpose; and demonstrations are largely confined to the plots of the Agricultural and Experimental Union members. The strength of the Union membership has of late increased considerably. In 1942 we had 430 members on the role and now we have nearly 1,000. This sudden increase in the membership is a happy augury for the good future of the Union itself. This increased membership is to be accounted for as mainly due to the appreciation of the service that is being rendered to members and the ryots in general by the staff of the Agricultural Department and not to any executive fiat. We want more members and in thousands so that we could form District, Taluk and Hobli Unions and function on democratic basis. When we have reached such a stage in the growth of our Union, we consider the question of sending our representatives from the District Unions to the Councils of the Board of Agriculture, Legislative Assembly, etc. Already the Union has 12 affiliated associations, and we are looking forward to the day when the Union will have branches of its own in all Hobli Headquarters of the State. It is already contemplated to build a Union Home in Bangalore. The funds provided by Government are not enough. We need at least Rs. 500 for each Hobli to turn out useful work embracing all aspects of improved Agriculture and Animal Husbandry.

In America and England these non-official bodies—Farmers County Councils or Unions—are helping Government in various ways. The American Agricultural Adjustment Act is operated through the agency of the County farmers or unions by the Secretary to Government. And at present in England the County Agricultural Councils who are empowered by ordinances, are actively co-operating with Government in the Grow More Food Campaign. We want our Union members to emulate their counterpart elsewhere and help the Government and the Country at large in critical times such as the present. So far I have dealt on the Development of Agricultural Extension work through the co-operation of Union members. There is one other aspect in this connection I wish to touch upon, which, perhaps, may sound as novel to many. When we talk of Agriculturists we generally mean the male member who follows the plough furrow. But the farmer's wife

or his children are just as important as the father farmer from the point of view of agricultural extension.

So far as we know more than half the manual work on the farmsted is performed by the farmer's wife. She feeds the cattle and calves, milks the cows, cleans the stalls, preserves the food-grains, attends to weeding, transplanting and harvesting, etc. In addition to all these, she attends to the needs of the children, feeds and clothes them. If such a helpmate of the farmer should remain quite ignorant of the ways in which all the work has to be performed in the new way, all the efforts—say of the Union Member-Farmer to improve his farm conditions will be in vain. Attempts at agricultural improvements will be one-sided only. Therefore, a certain amount of propaganda to reach the farmer's wife as to how best she can discharge her portion of the domestic and agricultural work, is to be highly desired. Ways and means of achieving this object have to be devised. Though this may sound novel and perhaps ridiculous to many, nevertheless, in Western and agriculturally advanced countries agricultural propaganda is carried to the very door of the Farmer, his wife and children. Women demonstrators have been employed for this purpose. When we can attain this stage in our Agricultural Extension work remains to be seen. The Agricultural and Experimental Union has survived several vicissitudes and is now marching on with greater confidence and success and let me hope in the near future it will not only form Hobli Unions, organise its own propaganda section, but also unify agricultural interest of the country as a whole and go forward with strength so as to form a Federation of Agricultural and Experimental Unions of the State.

K. H. Sreenivasan.

Local Committees of Agricultural and Experimental Union and Model Farms

I happened to be at Mysore this Dasara season and had the opportunity of being present at the meeting of the members of our Union in the Mysore taluk. A regional committee was formed at this meeting and taking part in the proceedings as the Vice-President of the Union, I felt that with the co-operation of the Agricultural Department we could indeed organise ourselves into a network of these committees all over the State. We would then have our District, Taluk and Hobli Committees along with the Village Associations at the base. The formation of as many as a dozen Village Associations affiliated to the Union in the Shimoga and other districts recently strengthens the hope that such an organisation is a practical proposition.

We are now keeping together practically as readers of our Journal; the English is published quarterly and the Kannada is published monthly. Each member gets a copy of the Journal and each affiliated association gets two copies for every Rs. 5 subscribed by it. Bringing together the members for Field-Days on Experimental Farms and arranging discussions has been a specific activity. We would very much like to hold a number of Field-Days in a year in different districts so that all our members can take part in one or the other of them. The Local Committees are the appropriate agencies for the kind of work. The central idea of the Union is that each agriculturist should be an experimenter. Here it must be stated that the organisation of Subvention Farms and Demonstration Plots on the raiyats' holdings in thousands by the Agricultural Department has materially helped to take this idea of experimentation to the doors of the raiyats. In trying out the seeds and manures advocated by the Department on his farm, in noting his own observation with reference to crops and livestock and in reviewing his costs of cultivation each agriculturist who is experimentally minded has a fund of information which he can communicate to his brothers of the trade. This mutual consultation both through the Field-Days and the pages of the Journal of the Union forms yet another strong point of the organisation.

Turning back to the pages of the old issues of our Journal, it is seen that since the inception of the Union, the members have ventured to give their opinion on various kinds of agricultural problems. Symposiums seem to have been held for such topics as development of livestock and the manure problem in the State. Formation of agricultural colonies was one of the early subjects discussed. So also was the organisation of model farms in the taluks. Since this last subject coincides with the discussions we have had among ourselves at the formation of the Taluk Committee in Mysore and later I would like to note down a few points with regard to it.

The Bombay Plan for Post-War Reconstruction

The Bombay Plan for the post-war reconstruction of the country includes a para on Model Farms. It is proposed that there should be a Model Farm for every ten villages and that it should include a dairy and a veterinary section. The initial cost of starting such a farm is estimated at Rs. 50,000 and the remaining expenditure at Rs. 20,000 per year. It may be stated that the formation of Model Farms is one for general acceptance, though there may be differences of opinion as to details. The Mysore Agricultural and Experimental Union consists of members, who in the nature of their profession, are interested in this development.

(1) There may be one Model Farm for every Hobli, in the State. One for every taluk may be started, in the first instance and then one for each Hobli.

(2) A Model Farm is different from an Experimental Farm. In general the Model Farm is to try only proved seeds, manures and implements and it can be built on the more direct co-operation of the Government and the people.

(3) The minimum requirement would be the initial grant of a suitable piece of land and the services of a person in charge of it. A portion of the land should be such as could be irrigated; the extent would depend on the possible sources of irrigation. The person in charge, granting that absolutely no equipment or labour is given to him to develop the farm, can straight off be an extension worker visiting the farms around and giving suggestions regarding improved agriculture, the work he can do in this way being in proportion to his qualification.

(4) The development of the Model Farm can thereafter be a co-operative work between a local organisation of the people and the Government. Such a local organisation is suitably a committee of the members of the Agricultural and Experimental Union in that place. The Committee can work in three ways: (*a*) suggest the developments they expect on the farm, (*b*) find funds or help to put into shape such developments and (*c*) see that labour is obtained for the farm from the villages served by it. The Government can take the suggestions of the committee and buy for the farm such implements and other stock as it can and otherwise contribute towards its equipment. Indeed there can be a number of ways of mutual adjustment.

(5) The picture of a Model Farm is roughly as follows:—It has its field crops, vegetables and the orchard. Along with the orchard goes the nursery. Then the farm has its seed storage. The seed store may have three kinds of stock: (1) seed grown on the farm, (2) seed stock of the co-operating farmers, (3) seed obtained from neighbouring districts. That is to say, there should be a seed storage and sales depot combined. A similar godown for manures is maintained. The implements and machinery section has three sections again, that of: (1) appliances in use, (2) machines for hire, and (3) implements

for sale. In addition a smithy and carpentry section may be maintained for repairs and local manufacture of implements. Particular crops, then, suggest particular equipments. Sugarcane will have its jaggery boiling equipment at which canes from co-operators' farms may also be crushed. Oil-seeds will have decorticators and pressing devices. Paddy will have hulling establishment. Cotton might have its small gin; and so on. Then there is the dairy, cattle yard and creamery, the poultry house, and the bee-hive. In short the institution is to be a Model Farm and Service Station in one. It should be what the local organisation of the people can make it, with the help given by the Government.

(6) There are a number of problems, such as soil erosion, which is for a whole village to solve apart from the Model Farm. Then there is rural credit which is a different affair and there are subsidiary industries. These problems apart, a number of agricultural improvements may be being tried on individual holdings. These are of two kinds, (1) improvements conceived and developed by the farmers themselves, and (2) improvements sponsored by subventions. The local committee will on the one hand see that the Model Farm is developed for service and on the other keep track and take stock of the improvements so effected. With reference to this kind of work the Model Farm will serve as a bureau, an office and a school.

It would be a good move from the Government if lands are allotted for this development in all taluk units where there are more than 50 direct members of the Agricultural and Experimental Union and in Hobli units where there are more than 20 direct members and local committees of the Union are formed.

S. Srinivas.

The Field-Day, the 25th Annual General Meeting and the Silver Jubilee of the Mysore Agricultural and Experimental Union

More than 200 members of the Agricultural and Experimental Union gathered at the offices of the Agricultural Department at 8 a.m. on the morning of Saturday, the 25th of November 1944. Transport was arranged to take them to the Government Experimental Farm, Hebbal. On the Farm the members went round the fields and visited the Exhibition that was specially arranged for them. They all returned from the Farm by Transport at 12 noon.

After dinner at the premises of the Sree Jayachamarajendra Occupational Institute canteen in the Cubbon Park, the members assembled in the hall of the General and Revenue Secretariat Club for the business meeting. The President of the Union was in the Chair and the Vice-President presided over a part of the meeting.

The Secretary's Report was read and placed before the body along with the audited Accounts for 1943–44 and the Revised Budget for 1944–45. These were passed by the General Body.

The following resolution was proposed by Mr. S. L. Narasimhia, seconded by Mr. Venkatarama Sarma and passed *nem con* :—

Resolved that the members of the Mysore Agricultural and Experimental Union wish to place on record their felicitations to Rajamantrapravina H. B. Gundappa Gowda, B.A., B.L., Minister for Local Self-Government and Public Health, on the conferring of the title of ' Rajamantrapravina ' on him by His Highness the Maharaja of Mysore.

The members learnt with sorrow the recent demise of Dharmaniratha G. Venkataramaniah and passed the following resolution of condolence :—

" The members of the Mysore Agricultural and Experimental Union learn with great sorrow the sad demise of Dharmaniratha G. Venkataramaniah, who was long a member of the Union and served on its Managing Committee for a number of years. His charities brought him close to the Agricultural Department especially in founding the Ramakrishna Krishisala. The members pray to God that fortitude may be vouchsafed to the bereaved to bear the loss, that is the loss of a large circle of friends and relations."

Mr. K. H. Sreenivasan, Deputy Director of Agriculture, moved and Mr. S. L. Narasimhia seconded the resolution pertaining to the ' Grow More Food' campaign. There was a heated discussion about the present methods of giving help to raiyats and finally the resolution was passed in its original form.

" The present Assembly suggests that each member of the Agricultural and Experimental Union should grow more food and thus help the Government to solve the present food shortage : each of them should make it a point to educate his neighbours in the villages to the need of the hour.

" It is also resolved that to effectively carry out the above idea the members should try their best to form a Grow More Food Committee for each Hobli."

The following resolutions were moved by the Vice-President, seconded by Mr. S. L. Narasimhia and passed unanimously by the assembly :—

" The members of the Mysore Agricultural and Experimental Union convey their gratitude to the Government of His Highness the Maharaja of Mysore, for the annual subvention graciously granted and request that in view of the appeals already made and the considerable increase in the membership of the Union, the annual grant may kindly be raised to Rs. 3,000 per annum."

The President and the Vice-President welcoming the Dewan (*centre*)

The Minister for Local Self-Government, Public Health and Agriculture (*right*) and the President of the Union—Director of Agriculture in Mysore—(*left*) at the Jubilee

The Silver Jubilee Field Day at the Hebbal Farm
Members of the Union interested in Sugarcane

Silver Jubilee Group at the Daly Memorial Hall
Bangalore

" The members of the Mysore Agricultural and Experimental Union represent on the occasion of the Silver Jubilee of the Union, the fact that the number of members has increased threefold in the course of last year and it was found that the Jubilee had to be celebrated in consonance with the increase in members, proposing to publish a special Silver Jubilee Number of the Journal of the Union and pray that a sum of Rs. 500 may kindly be specially sanctioned towards the Silver Jubilee expenses by the Government to this organisation consisting primarily of the agriculutrists of the State interested in scientific agriculture."

" *Resolved* that the Mysore Agricultural and Experimental Union is thankful to the Revenue Commissioner in Mysore and the Deputy Commissioners of all the districts for having recommended the Kannada Journal of the Union to the Village Panchayats all over the State, and, seeing that there are only 36 Village Panchayats now subscribing to the Journal, the Union requests the Revenue Commissioner kindly to renew the recommendation so that at least 50 Panchayats in each Taluk may subscribe for the Journal which is the only Agricultural Journal dedicated to convey the lessons of technical agriculture in a popular manner straight to the ryot in Mysore."

"*Resolved* that the members of the Mysore Agricultural and Experimental Union convey their gratitude to the Director of Public Instruction in Mysore for having extended his kind patronage to the Kannada Journal of the Union by recommending it to the middle schools all over the State and request that the recommendation may kindly be renewed so that all the Primary, Middle and High Schools in the State may be induced to subscribe to the Journal."

Mr. D. Veere Gowda of Malavalli proposed and Mr. H. K. Madiah seconded the following resolution which was unanimously passed :—

"*Resolved* to request the Government to sanction a constituency to the Mysore Agricultural and Experimental Union as a specific body of agriculturists interested in scientific agriculture to facilitate the election of a representative each to the Representative Assembly, Legislative Council and Economic bodies."

It was "*resolved* that a Bonus of a month's salary be given to the members of the Union staff for this year". The proposition moved by Mr. S. Srinivas and seconded by Mr. S. L. Narasimhia was accepted by the House.

Mr. S. Srinivas, the Vice-President, then moved the following proposition that "this body feels that in the interests of Agricultural Science in this province a Degree course should be provided for the subject in the University of Mysore, and that while wholeheartedly supporting the move already made in the direction, the body recommends that action must be considerably expedited and would be very glad to see an Agricultural College started next June". It was suggested that the present Mysore Agricultural School, Hebbal, might be converted into that college. Mr. S. L. Narasimhia seconded the proposition and the resolution was passed.

The following amendment was proposed in the constitution and rules of the Union and passed unanimously :—

APPENDIX I

Affiliated Associations

Clause 4

For "....One copy each of the Union Journals for the whole year, both English and Kannada shall be sent to the affiliated association."

Read "....One copy each of the Union Journals for the whole year, both English and Kannada, or two copies of the Kannada Journal shall be sent to the affiliated association as may be desired."

Clause 6

For "....Each affiliated association shall have the right to obtain one more copy each of the Union Journal for every extra five rupees of its annual contribution."

Read "....Each affiliated association shall have the right to obtain for every extra Rs. 5 of its annual contribution, two more copies of the Kannada Journal or one copy each of the English and Kannada Journals as may be desired."

Mr. Kempanna proposed, Mr. H. K. Madiah seconded and the body unanimously elected Mr. M. J. Narasimhan, B.A., Director of Agriculture in Mysore, as President and Mr. S. Srinivas as Vice-President.

A number of names were proposed for the nine places on the Managing Committee and elections conducted.

Mr. S. A. Gangadhara Sastry, M.A. (Litt.), LL.B., M.Com., was reappointed unanimously as Auditor for the year 1944-45 also.

Members had sent a number of subjects for discussion. Such of them for which the proposers were present were taken up. The subjects and the decisions of the body are indicated below :—

SUBJECT	DECISION
Mr. D. Veeregowda of Malavalli—	
1. Ryots have not sufficient animals with them to prepare enough manure for their lands. Other manures are not known to them. Preparation of compost should be practically demonstrated in the villages of the Irwin Canal area.	Passed for recommendation to the Agricultural Department.
2. Fertilisers from the 'Mysore Chemicals Company, Belagula' should be arranged to be supplied to ryots at concession rates.	Passed for recommendation to the Agricultural Department.
3. Growing of Napier and other grasses should be popularised further in the Irwin Canal area.	Passed for recommendation to the Agricultural Department.
4. This body recommends to the Government that wherever the block system of irrigation is in vogue water supply to ryots should be in the hands of the Agricultural Department.	Passed for recommendation to Government.
5. This Union to be named 'Mysore Agriculturists' and Agricultural and Experimental Union'.	There is no need to change the present name. It aptly describes the association and the body is registered under that name.
6. The monthly Journal may be made a weekly, changed to the size of a newspaper containing agricultural articles as well as news and be sold at an enhanced rate of subscription.	The Journal may be continued as at present being devoted to its special ideals.
7. Government must be requested to permit the Union to post the Journals 'On Mysore Government Service' as also letters of the Union.	Resolved that Government may be addressed in the matter.
Mr. Venkataraya Sarma—	
8. Cultivation behind small tanks with about 100 acres achkat needs to be controlled. As the water in such tanks will not be sufficient for a regular puddle paddy crop, the system should be completely changed so as to grow a Punji paddy crop in the monsoon. This admits irrigation of all plots in the achkat by turns. If the tanks have surplus water later a crop of ragi or fodder jola can be raised in the achkat. Control is necessary so that all the holders may get the tank water and raise a decent crop.	The subject may be referred to the Engineering Department.
9. Large landed holders having more than 50 acres of land are finding that manures cannot be obtained even though they are ready to pay full control prices. Ways and means must be found to augment the supply.	Passed for recommendation to the Agricultural Department.
10. Engines and pumps have become scarce. New wells have to remain useless even if opened. Arrangement should be made to supply the engines and pumps of suitable power and size.	Passed for recommendation to the Agricultural Department.

Subject	Decision
Mr. H. S. Dhruva, Gopenhally—	
11. Issues from Agricultural Depots to ryots may be made on production of revenue pattas instead of insisting as at present on certificates from Revenue authorities.	Passed for recommendation through Agricultural Department to concerned authorities.
12. Stocking of implements, seeds and manures may be made in large quantities preferably through village panchayats so as to reach interior villages.	Passed for recommendation to the Agricultural Department and through it to allied departments.
13. Yields of food grains in the different areas may be properly assessed by the Agricultural Department and their figures should be adopted by the Food Department in acquiring food grains.	Passed for recommendation to Government.
Messrs. M. Seetharamiah, Ardeshhally, A. Munisamappa, Annavara, R. Dasappa, Reddyhalli and M. Veera Muniappa, Devanhally—	
14. Just as it is arranged to supply groundnut oil-cake at concession rates to paddy and *natragi*, it must be supplied at concession or controlled rates to other crops as well.	Passed for recommendation to Government.
15. The special breeds of cattle belonging to Mysore, Amritmahal and Hallikar are dwindling. Their milk yield has gone down very much. Government should arrange to preserve the breeds so as to maintain their hardiness and special qualities and also improve the milk yield.	Passed for recommendation to Government.
16. Arrangement must be made to allot not more than 5 acres each in the gomals to cattle owners so that they may grow fodder for their cattle.	Passed for recommendation to Government.
17. Union members should be supplied bee-hives at concession rates.	Passed for recommendation to the Agricultural Department.
18. Arrangements should be made to supply seeds well in advance of the sowing season and help the ryots.	Passed for recommendation to the Agricultural Department.
Mr. S. M. Nanjappa, Hoskote Taluk—	
19. At present the Department is supplying 1 bag of groundnut cake per acre to paddy and ragi crops. This is not sufficient. Even farmyard manure is becoming scarce latterly. 2 Bags of groundnut cake and ½ bag of mixture fertiliser must be arranged to be supplied per acre.	Passed for recommendation to the Agricultural Department.
20. Mulberry is an important crop in Hoskote. Silkworms are being reared on this and cocoons sold by the ryots in markets controlled by Government. It is but right that enough manure be given to grow a crop so essential to Government. 2 Bags of oil-cake per acre of this crop may be arranged to be supplied.	This subject may be referred to the Sericultural Department.
21. Potato is being grown extensively in Hoskote about 75% of the crop grown in the whole of Bangalore district. Ryots are losing a great deal since even adequate farmyard manure is not available for the crop. The Agricultural Department must supply 4 bags of oil-cake and 1 bag of fertiliser per acre of this crop.	Passed for recommendation to the Agricultural Department.

Subject	Decision
Mr. Kalasi Somappa, Manchale, Sagar—	
22. In order to help areca growers the Agricultural Department should advance loans repayable in 10–15 instalments, from the areca cess fund in the same way as the Revenue Department gives *taccavi* loans.	Passed for recommendation to Government.
23. With reference to collection of tax on areca, the present method may be modified and a branch of the 'Areca Marketing Society' might be opened at Sagar.	The subject may be referred to the Registrar of Co-operaitve Societies.
Mr. B. A. Hussain Saheb, Bannur—	
24. Bannur is a place having a population of more than 7,000. The hobli of which it is the centre consists of 30 villages. The locality is a special agricultural tract. Still there is only an agricultural sub-depot in the place. It is requested that a pucca depot be opened here and an Agricultural Inspector with two fieldmen be allotted to the place.	Passed for recommendation to the Agricultural Department.
Mr. K. M. Basavaraj, Arsikere—	
25. All the Village Panchayats should subscribe to our Journal.	Passed; a resolution has been passed to this effect.
26. The Department is supplying bulls at Rs. 75 and Rs. 150 per animal. This is rather costly and ryots are feeling the trouble even now. The prices should be reduced to Rs. 50 and Rs. 100 per animal as before.	Passed for recommendation to the Agricultural Department.
27. When the Amritmahal kavals are surrendered to the Revenue Department the Director of Agriculture has no more hold on the lands. In formation of new colonies, etc., the Director of Agriculture is not consulted. The difficulties of the breeders of cattle do not suitably reach the revenue authorities. This state of affairs requires rectification.	Passed for recommendation to Government.

The discussion of subjects terminated at 4 p.m. and the members moved to the Daly Memorial Hall, Cenotaph Road, for the Silver Jubilee. The Dewan and guests arrived at 5 p.m. The assembly gathered for the meeting after tea.

Mr. B. S. Ramachar sang the invocation. After the invocation, the President delivered the Welcome Speech (published elsewhere). Mr. S. G. Rangaswamy read the messages received from the Ministers Mr. O. Pullareddi, I.C.S., and Mushir-ul-mulk Muhammad Imam, B.A., B.L., Dr. L. C. Coleman, Mr. H. V. Krishnayya and Dr. V. K. Badami. The Vice-President, Mr. S. Srinivas, gave a review of the Union. The Chairman of the occasion, Pradhana Siromani. N. Madhava Rau, B.A., B.L., Dewan of Mysore, then delivered the speech of the day (published elsewhere). Mr. S. L. Narasimhia proposed the vote of thanks. The students of the Mysore Agricultural School sang the Mysore National Anthem and the Silver Jubilee Meeting terminated with three cheers to His Highness the Maharaja of Mysore.

M. Vasudeva Murthy.

Report of the Secretary at the 25th Annual Meeting of the Mysore Agricultural and Experimental Union

The last General Body Meeting was held in March 1944 at the Hebbal Farm. It was then pointed out that we were entering on our Silver Jubilee year. Accordingly we are holding to-day the Silver Jubilee of the Union. A review of 25 years of the Union and what the institution stands for will be found in the speeches of the President and the Vice-President and articles received for the Silver Jubilee Number of the Journal which is to be published shortly. The following is the business report of the Union :—

Strength.—There has been an appreciable increase in the number of members since the last meeting, from 431 to about 1,200 (including members and subscribers). The following are the details :

Members :	
English Journal—	
Official	143
Non-official	72
Kannada Journal	about 861
Subscribers :	
English Journal	20
Kannada Journal—	
Middle Schools	50
Village Panchayats	36
Individuals	18
Total ..	1,200

Two gentlemen have become our Life-Members.

Affiliated Associations.—We have long looked to the development along this line. Especially the Village Associations form compact bodies which can carry on intensive improvements in definite areas such as the units of a village or groups of villages afford. Of such associations we have now 12 : in Sagar Taluk 7, in Hosanagar 1, in Tiptur Taluk 1, in Honnali Taluk 2, in Channarayapatna Taluk 1.

Taluk Committees.—With the increase in membership, the thought of forming District, Taluk and Hobli Committees came up and a Taluk Committee was formed for the Mysore Taluk during the Dasara. It has been suggested that similar committees should be formed in other taluks beginning with those in which there are more number of members. The following taluks at present have more than 15 members :—

1.	Bangalore City, Taluk and Cantonment ..	141 (about)
2.	Channapatna	15
3.	Hoskote	34
4.	Devanhally	60
5.	Sira	18
6.	Seringapatam	20
7.	Mandya	30
8.	Maddur	18
9.	Malavalli	21
10.	Mysore	22
11.	Chamarajanagar and Yelandur	22
12.	Srinivaspur	16
13.	Chintamani	40
14.	Kadur	29

15.	Tarikere	38
16.	Chikmagalur	105
17.	Mudgere	22
18.	Arsikere	23
19.	Belur	15
20.	Hassan	17
21.	Closepet	29
22.	Tiptur	24
23.	Madhugiri	16

Village Panchayats.—The number of Village Panchayats subscribing to our Journal is 36 as shown before. In certain years in which special recommendation was made by the Revenue Commissioner and the Deputy Commissioners, the number had gone to more than 100. But it is evident that this is nowhere the number of panchayats one would expect.

Our Journals.—Except for the delay of a few months in the last number of the 23rd Volume of the English Journal, both that and the Kannada Journal have been punctually published. Thanks are due to the contributors who have thus helped the Journals. But, still the frequency and the variety of articles sufficient to keep the Journals going has to be attained.

Subscription.—The membership fees received this time have helped us a long way to clear the Press bills ; yet we are faced with a large sum under arrears. An amount of Rs. 67 has been written off the accounts as decided by the Managing Committee, and appeals are being sent and the co-operation of the Assistant Directors of Agriculture is being obtained to collect as much of the arrears as possible before deciding on writes off.

Popularising the Union.—It has long been felt that a move is necessary to make the Union known in the Districts. This time the idea was a little speeded up by placing the back numbers of our Journals in the Dasara Exhibition, distributing an appeal in the shape of a leaflet and utilising the presence of the Vice-President and the Secretary at Mysore during the Dasara for augmenting the personal contacts already developed by the local Agricultural Officers. Wherever the Secretary has had the opportunity of meeting the Assistant Directors of Agriculture and local members of the Union on the spot, it has been experienced that there are always possibilities of furthering the interests of the Union.

Exhibition.—While exhibiting the previous issues of the Journals at the Dasara our friends at Mysore suggested a development along the line. They were for having a stall for the Union itself and exhibiting in it produce sent by the members from various quarters also. This is already being done in the Agricultural Stall itself and to mention an example, Major C. B. Oakley exhibited Sisal Fibre and Tapioca Flakes this time. But it was felt that a separate block of the Union would bring out many more articles from the members and keep their efforts going.

Experiments and Contacts.—The Agricultural Department has arranged Subvention Farms, Demonstration Plots and 'A' Farms on the holdings of several members and reports being received from the circles are indicative of a growing number of contacts.

The Central Office of the Union.—The limitations of the Central Office of the Union are more and more keenly felt as developments take place.

(1) The increase in membership has meant more work, and ledgering, mailing, etc., connected with this badly requires at least one if not two additional clerks.

(2) More space is required for the Union and along with it definitely better arrangements and maintenance of books and papers to make the premises useful as a study room.

With this I place before you the Certified Balance Sheet and Statement of Income and Expenditure of the Union for 1943–44. The Budget for 1944–45, as placed before the last Managing Committee, stands for a revision in view of later figures.—

Membership and Subscription Fees were put at Rs. 2,880 ; due to the increaes in membership it may be placed at (1,200×3)=Rs. 3,600. A certain amount has been received as Silver Jubilee donation which may presently be taken at Rs. 400. On the expenses side we have to add Rs. 1,200 at least, for Silver Jubilee expenses, Special Number, Rs. 150 under Postage and Miscellaneous Expenses, and Rs. 480 under establishment, for a Clerk to the Union. There is a Silver Jubilee Number of our issue to be published ; our coming issues of the English and Kannada Journal can be converted into the special numbers, and an additional sum of Rs. 400 may have to be provided for printing under this head. The budget will then be as follows (*vide* statement on page 96).

Statement of Income and Expenditure for 1943–44

Expenditure	Rs.	A.	P.	Income	Rs.	A.	P.
To Establishment Charges ..	2,168	7	3	By Admission Fee ..	213	0	0
,, Printing ..	1,325	6	0	,, Membership Fee ..	1,313	8	0
,, Postage ..	173	2	6	,, Subscription ..	344	0	0
,, Stationery ..	23	14	0	,, Advertisement Charges ..	215	8	0
,, Audit Fee ..	25	0	0	,, Subvention ..	2,000	0	0
,, Contingency ..	13	6	0	,, Miscellaneous ..	54	12	0
,, Depreciation ..	15	11	2				
,, Anniversary ..	275	14	0				
,, Excess of Income over Expenditure ..	119	15	1				
Total ..	4,140	12	0	Total ..	4,140	12	0

Examined and found correct.

S. D. GANGADHARA SASTRY,
M.A. (Litt.), LL.B., M.Com.,
Govt. Certified Auditor.

BANGALORE,
19th September 1944.

M. VASUDEVA MURTHY,
Secretary.

Balance Sheet as on 30th June 1944

Liabilities	Rs.	A.	P.	Assets	Rs.	A.	P.
Fund ..	1,253	10	9	Cash on Hand ..	543	0	3
Bangalore Press ..	1,325	6	0	In Govt. S. B. ..	474	4	2
Subscriptions received in advance from—				Postage Stamps ..	2	8	0
				Furniture ..	193	9	10
				Library ..	270	15	0
				Arrears Due—			
Members Rs. 418–12–0				Members Rs. 1,413–14–0			
Subscription ,, 110—1–0				Subscribers ,, 121—3–0			
	528	13	0		1,535	1	0
Advertisement Charges received in advance ..	22	8	0	Advertisement Charges ..	41	4	0
				Excess of Expenditure over Income of previous years .. Rs. 183–10–7			
				Less Excess of Income over Expenditure in 1943–44 .. ,, 119–15–1			
					63	11	6
Total ..	3,130	5	2	Total ..	3,130	5	9

I have examined the above Balance Sheet with the books and vouchers maintained in the Union and have obtained all the information and explanations required. In my opinion such Balance Sheet has been drawn up correctly and exhibits a true and correct view of the state of affairs of the Union as on 30th June 1944, according to the best of my information and the explanations furnished and as shown by the books of the Union.

BANGALORE,
19th September 1944.

S. A. GANGADHARASASTRY, M.A. (Litt.), LL.B., M.Com.,
Govt. Certified Auditor.

Revised Bugdet for 1944–45

Receipts	Rs.	A.	P.	Expenditure	Rs.	A.	P.
Membership and Subscriptions	3,600	0	0	Establishment ..	2,262	0	0
Advertisement Charges ..	250	0	0	Plus ,, ..	480	0	0
Interest on S. B. Account ..	25	0	0	Printing—			
Government Subvention ..	2,000	0	0	English Journal ..	600	0	0
Silver Jubilee Donations ..	400	0	0	Kannada ,, ..	960	0	0
				Reprint ..	100	0	0
Total ..	6,275	0	0	Special Nos. of Kannada and English Journals ..	400	0	0
Add—				Miscellaneous Printing ..	200	0	0
Cash Balance on Hand (1-7-1944) ..	1,017	4	5	Postage ..	450	0	0
Arrears—				Books and Stationery ..	50	0	0
Members 1,413–14–0				Miscellaneous Contingencies ..	50	0	0
Subscribers 121—3–0				Depreciation ..	15	11	2
Sundry Debtors 41—4–0				Audit Fees ..	25	0	0
	1,576	5	0	Field-Day and Silver Jubilee ..	1,200	0	0
Total ..	8,868	9	5	Total ..	6,792	11	2
Deduct—				Excess of Income over Expenditure ..	199	3	3
Membership Advance 418–12–0							
Subscription Advance 110—1–0							
Sundry Creditors 1,325—6–0							
Advertiser's Advance 22—8–0							
	1,876	11	0				
Grand Total ..	6,991	14	5	Grand Total ..	6,991	14	5

The Mysore Agricultural and Experimental Union Bangalore

(*Registered under Act III of* 1904 *and Act V of* 1939)

CONSTITUTION AND RULES

(*Brought up to date*)

Name—

1. The name of the Association shall be "The Mysore Agricultural and Experimental Union".

Headquarters—

2. The headquarters of the Union shall be located in the Office of the Department of Agriculture, Bangalore.

Objects—

3. The objects of the Union shall be :
   (*a*) To further the development of Agriculture in Mysore,
   (*b*) To exchange ideas with a view to improve scientific knowledge about Agriculture, and
   (*c*) To arrange for experiments in the holdings of the members in co-operation with the Department of Agriculture.

Work of the Union—

4. The work of the Union shall consist of :
   (*a*) Publishing a Journal in English and one in Kannada, containing articles of agricultural interest,
   (*b*) Arranging for circulation of books and periodicals on agriculture among the members,
   (*c*) Arranging for the meeting of the members annually and periodically, and
   (*d*) Undertaking such other items of work as are in consonance with the objects of the Union.

Membership—

5. The membership of the Union shall be open to :
   (*a*) Agriculturists and such others as are interested in the development of agriculture in the State,
   (*b*) The members of the staff of the Agricultural Department, and
   (*c*) Those who have received agricultural training in some recognised agricultural institution, provided that the approval of the Committee of Management is obtained in each case.

Every applicant for admission shall pay an admission fee of Rupee one and an annual subscription of Rupees three or such amount as may be fixed by the Union from time to time.

The Union year is from July to June next (both months inclusive).

The membership of any individual commences from the first of July in each year. If a member pays his first annual fee any time before the end of December, he will be considered to have paid it all the same from the 1st of July of that year to the 1st of July next. Members paying their first annual fee on 1st of January and later need pay only half the annual fee, so that next year's account may begin on the 1st of July correctly. Any excess paid will be taken as advance subscription and further calls for payment will be made in accordance with it.

5. (i) The term of commencement applies only to the membership fee and not to subscription to the Journals apart from membership. Subscriptions commence from any issue of the Journal either Kannada or English.

5. (ii) Such of the officers of the Agricultural Department as are members of the Union and are receiving the English Journal will be supplied the Kannada Journal also at an extra Re. 1 per year.

Life-Members—

6. Such of the members as pay a lumpsum of Rs. 100 will be taken as Life-members of the Union.

Affiliated Associations—

7. Any agricultural association accepting the objects of the Agricultural and Experimental Union and desiring to co-operate with it may be taken as an affiliated association, according to rules framed in this regard.

Arrears of Subscription—

8. Members who are in arrears of their subscription for two years consecutively shall cease to be members ; but it shall be open to them to revive their membership on payment of their dues and a re-admission fee of Rupee one.

Disabilities—

9. Any person convicted of a criminal offence involving moral turpitude or adjudged to be insolvent shall be ineligible to continue as a member.

Management—

10. The management of the Union shall be vested in a Committee, consisting of a President, a Vice-President, a Secretary and nine other members, all to be elected annually by the General Body of the Union. Provided, however, that so long as the Government appoints a Secretary to manage the affairs of the Union, this rule in so far as it relates to the election of the Secretary shall not be operative. The Director of Agriculture, the Deputy Director of Agriculture and the Superintendent of Veterinary Services in Mysore shall be *ex-officio* members of the Committee of Management.

Casual vacancies in the Committee shall be filled up by the Committee.

Functions of the Office-bearers—

11. The President shall preside at all the meetings of the Committee and of the General Body. In cases of urgency, the President shall have power to take such action as he may deem necessary without consulting the Committee, which should be informed of such action at the earliest opportunity.

The Vice-President shall perform all the functions of the President during his absence, or such other duties as may be delegated to him by the President from time to time.

The Secretary shall manage all the correspondence of the Union and shall be in charge of all its records. He shall be responsible for their proper maintenance and preservation. He shall enter the minutes of all meetings of the Union in a book kept specially for that purpose, separate books being maintained for the meetings of the Committee and the General Body. He shall convene all the meetings of the Union under the direction of the President. He shall be in charge of the funds of the Union under the control of the President and shall collect subscriptions, grant receipts and keep an accurate account of all receipts and expenditure.

Staff of the Union—

12. The Managing Committee shall have power to appoint the necessary staff required for the working of the Union.

The Editorial Board—

13. There shall be an Editorial Board for conducting the English Journal and the Kannada Journal of the Union. It shall consist of twelve members of the Union, elected once in three years by the General Body of the Union. The Board shall appoint one of its members as the Chief Editor for the English Journal and another for the Kannada Journal. The Secretary of the Union shall be the *ex-officio* Secretary of the Board. Casual vacancies in the Board may be filled up by the Board. It shall have power to co-opt not more than three persons who may or may not be members of the Union.

14. (*a*) The Committee of Management shall meet as often as may be necessary for the transaciton of business. There shall be not less than four Committee meetings in a year. At least three clear days' notice shall be given to the members. Five members shall form a quorum. If business cannot be transacted at a Committee meeting for want of a quorum, the meeting shall be adjourned to a subsequent date of which due notice shall have been given to all the members. The adjourned meeting shall transact only the business notified in the original meeting, irrespective of whether there is a quorum or not.

Meetings—

14. (*b*) There shall be an Annual General Meeting of the Union at which the Secretary shall present the Annual Report of the Union for adoption by the General Body. Elections to the Committee of Management and the Editorial Board shall be held at this meeting.

Papers on the results of work done by the members may be read at the Annual General Meeting provided that they have been previously approved by the Committee of Management. Members who desire to read papers or to bring up subjects for discussion or resolutions for adoption at the Annual General Meeting of the Union shall send in their papers or the subjects or copies of the resolutions to the Secretary at least a week previous to the meeting.

In the case of the Annual General Meeting at least a clear fortnight's notice shall be given to the members.

One-third of the number of members on the rolls of the Union or 20 members, whichever is less shall form the quorum.

Members who are in arrears of their subscription for more than 3 months at the time of the meeting shall not be entitled to vote or bring up subjects for discussion or resolutions for adoption.

14. (*c*) The President shall have power to call extraordinary or special meetings of the Committee or of the General Body, either on his own initiative or on a written requisition from not less than one-fourth of the total number of members in the case of the Committee meetings and of not less than twenty members in the case of the General Body meetings, clearly specifying the subject or subjects for discussion at such meetings. The extraordinary or special meetings requisitioned for by the members shall be convened within a fortnight of the date of receipt of the application.

Miscellaneous—

15. The income of the Union shall consist of :

(1) the subvention that may be granted by the Government,
(2) admission fees and membership subscriptions,
(3) subscriptions to the Journals,
(4) fees received from affiliated associations, and
(5) miscellaneous receipts.

The funds of the Union shall be deposited in the Government Savings Bank. Expenses relating to the Field-Day, the General Meeting, purchase of furniture, etc., shall be sanctioned by the Committee of Management.

An imprest amount that may be sanctioned by the Committee of Management shall be held by the Secretary to meet contingent charges of the Union Office.

No property of the Union except unserviceable articles shall be disposed of without the approval of the General Body.

Moneys for expenses shall be withdrawn by the Secretary from the Government Savings Bank after obtaining the approval of the President or any member of the Committee of Management nominated by him.

The Accounts of the Union shall be audited annually by an auditor to be appointed by the General Body.

Dissolution of the Union—

16. The Union shall not be dissolved unless and until three-fifths of the total number of members on its rolls vote for its dissolution at an extraordinary General Meeting convened for the purpose and such resolution is approved by the Government.

APPENDIX 1

Rules for the Affiliation of other Agricultural Associations in the State

Any Agricultural Association desiring to be affiliated to the Mysore Agricultural and Experimental Union may be affiliated on the approval of the Committee of Management being obtained according to the following conditions :—

(1) At the time of application, the association shall have at least 10 members on its rolls within such distance of one another as to make their daily meetings possible.

(2) The objects of the association to be affiliated shall be in conformity with the objects of the Mysore Agricultural and Experimental Union.

(3) Each affiliated association shall pay to the Union an annual contribution of not less than Rupees five in advance.

(4) Each affiliated association may delegate one of its members to be the member of the Mysore Agricultural and Experimental Union. He shall have all the rights and privileges of the members of the Union except supplies of copies of the Journal. One copy each of the Union Journal for the whole year, both English and Kannada, or two copies of the Kannada Journal, shall be sent to the affiliated association, as may be desired.

(5) Each affiliated association shall have the right to send one more delegate to the Union and obtain one more copy each of the Union Journals or two more copies of the Kannada Journal for every extra five rupees of its annual contribution.

(6) A member of an affiliated association may obtain the Union Journal for himself at a concession rate of two-thirds of the full annual subscription.

(7) Every member of the affiliated association may attend the General Meetings of the Mysore Agricultural and Experimental Union and take part in the discussions and also conduct experiments on his holdings just as the members of the Union, but cannot bring up subjects or vote on them.

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